FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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Flight.

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EDITORIAL COMMENT.

The FLIGHT Staff and the War.

The war has not left the staff of FLIGHT unaffected. Indeed, we may fairly claim that this journal, and its sister publication, the *Auto.*, has done well in the matter of the proportion of the joint staff which is now away on active service. By the latest accession of our staff to the King's forces, that of Mr. W. Whittall, who has long been connected editorially with these journals, and who has been given a commission in the R.N.V.R. and attached to the Air Department of the Admiralty, we have now lost just upon forty per cent. of the staff, while of those who remain others are doing good work as special constables or in other directions. We are pleased, very pleased, with the record, and although our readers may miss, like old friends, their particular work, they will, we are confident, join with the remainder of the staff in wishing those who have gone a speedy return, and will look forward to welcoming in our pages once more their weekly contributions, which we have every reason to know have been much appreciated in the past.

* * *

German Mastery of Aerial Detail.

In this issue we are able to furnish our readers with some highly instructive information revealing yet another phase of the German quality of thoroughness in preparation. The double page map published in this issue shows all the German aircraft centres together with plans drawn to a uniform scale of all the German aviation grounds, and the scheme for signalling and guiding by lights at night so that German aviators passing over the Fatherland may know his whereabouts almost as surely as though he could see the terrain below him by the light of a clear day. As is explained in an accompanying article, the system of signalling by light is of a complete yet a simple character, for it is an essential of all practical schemes that they shall be simple. Thus three degrees of light are employed in combination with modes of signalling under the Morse Code, and so forth.

All this detail has been built up in peace, much of it under the name of sport. Yet we now see the vast importance of all the work and how every detail of it dovetails into the scheme of war on which there has been expended vastly more, even in peace time, than was ever acknowledged to the mere score of Naval or Military Budgets. For instance, education has had to bear very heavy charges for school buildings, one feature of which could never be accounted for satisfactorily. Each state school has an elaborate kitchen which there was never any call to use for the purposes of the pupils. Now the Fatherland is engaged in war, however, the object of the whole scheme is revealed by the fact that every Public School in Germany really becomes a barracks in time of war, with the kitchen specially designed to cook meals for large numbers of men. It is so wherever we look, flight being no exception to the German scheme. The Teutonic temperament is not brilliant, yet we are always told that genius is an infinite capacity for taking pains. If it is that and nothing else, then the Germans, collectively and individually, are the greatest geniuses in the world to-day.

* * *

An Object Lesson.

But there is more in the business than that, as we know already from the fact that, man for man, our service flyers at the front are superior to the German flyers and that certainly for every point of superiority German aircraft enjoy over equipment of our own, there could be named a point wherein our own are superior to our enemy's. This, however, does not mean that we can forthwith afford to let Germany go her own way as a matter of indifference to us. The complete scheme of interior organisation which it is our special purpose to reveal this week is an object lesson of the first order and an accomplishment the significance of which is fully

appreciated by those concerned with the Allies' aeronautical operations. At the moment the full benefit of possessing so elaborate a plant within the borders of the Fatherland is scarcely apparent in that every one of the leading European nations has possessed itself of bases for aircraft, of factories for producing them, and of trained men to use them. While Germany is engaged more or less in the countries of those with whom she is at war, therefore, the fact of her having possessed herself of a system that enables her pilots to travel about at night with extraordinary facilities for checking their navigation, means little more than that the hours of darkness can be used to transport aircraft from one centre to another and that some of the bases employed can be further away from frontiers of operation than would otherwise be convenient.

But when the inevitable period arrives for the Allies to begin fighting Germans on their own land, the great advantages possessed by so complete a scheme as that of which we give details will at once be apparent. The scheme is in a sense so simple, yet so complete in its details, that it will be a very severe task upon our Flying Services to make far reaching counter attacks by aircraft. But if the military advantages of attempting any such scheme of reprisal is considered worth the pains and risks involved then we may be sure officers in the Air Services will be found ready to undertake whatever is required of them.

• • •

The British Way. There is, however, another aspect of the matter, furnished by the enterprise of the Royal Air Service in its attack on the Zeppelin shed at Düsseldorf. Since we commented on Lieut. Collet's particularly brilliant exploit last week, there have come to hand, firstly, more official German denials of any appreciable damage having been done, and, later, indisputable evidence from Germany that damage was done not only to the airship hall and to some of the gas bags of a Zeppelin craft, but also to some repairing and manufacturing plant. A brief consideration of the completeness and widespread extent of the German scheme of aviation for national uses must reveal, even to the non-military mind, that there is here offered a vast field for counter enterprise on the part of the British airmen when the right time comes. That qualification is particularly to be noted, for in this matter Britain has started out as she means to continue. While Lieut. Collet was able to discern and successfully to attack the Zeppelin plant at Düsseldorf, some of his colleagues were endeavouring to carry out a similar enterprise at Cologne, under conditions of mist. They flew about over the city for more than an hour, vainly endeavouring to locate their one and only objective. Failing to do so, at last, and we may be sure reluctantly, they gave up the attempt and rather steered back to their base than run the least risk—whatever at first thought might have been their feelings of reprisals for the enemy's dastardly deeds—of their missiles falling on some building other than the particular series which was the sole purpose of their aerial visit. That is the British "uncultured" way. Of course it affords the most striking contrast conceivable with German aerial methods as illustrated notably by the attacks on Antwerp, Ostend, Paris, and such like centres, wherein the marksmanship appears to have been extraordinarily lacking in accuracy, and wherein buildings not only protected by the Hague Convention but also by all ideas of humanity and even by the exigencies of military policy, have been wantonly attacked with loss of life to civilian non-combatants and even to those lying on beds of sickness. That the aerial activities of both sides engaged in this campaign will tend rather to increase than to diminish as it progresses is certain.

That Germany will learn the wisdom of remodelling her ways is not so certain, judging from the fact that even her official excusers in America have not attempted to defend such methods of waging aerial warfare as have outraged humanity and brought her into such bad odour among the neutral Powers. But that Britishers will depart from their methods of waging aerial war strictly according to the rules of the game is impossible.

We have started in a manner worthy of our history. Our Third Arm is covering itself with a glory none the less enduring because the time has not yet come to tell the full story to the world. Those who are making this magnificent chapter of history are men of valour. It is not possible for any such to do aught of an unchivalrous nature.

• • •

The Unseen Vaster than the Seen. In considering the work of the aerial arm in this war, the public should realise that its activities are by no means limited to what is recorded either in official or unofficial despatches. The news that comes through is merely such as can be made known without in any way adversely affecting the interests of the Allies. Obviously the major part of the work that is being done is of a character that cannot be revealed until long after the event, because to make it known earlier would be to affect adversely those very interests. Let us therefore think all the time not only of those naval and military air officers whose names may escape into print, but also of the much greater number of their colleagues engaged in the theatre of war who are doing work none the less risky, none the less brilliant, and none the less valuable, day and night, but which may not be written about now, and which in consequence may be heard of little at all in that the passage of a few weeks oftentimes sees such a vast change wrought in the situation as to alter the whole perspective and therefore to prevent those away from the scene appreciating the scope and significance of something accomplished some weeks earlier in the campaign.

There was never a war that called for such unselfishness and self-effacement as this. No arm is being called on to exercise those qualities to a greater extent than the Aerial one. General Buller was wont to make an observation to the effect that soldiers were all the time doing grand things on campaign, and that it was the merest matter of chance as to whether any one enterprise came to the notice of a War Correspondent and chanced to become public knowledge in consequence. There was a vast amount of truth in the remark. It must be the consolation of our air forces at the front in a campaign wherein the War Correspondent is widely eliminated, that if the general circumstances are such that our flying forces can only receive credit in terms the most general, the old order which is now changed also had its disadvantages, to which testimony has been borne by so typical an example of much that is characteristic of British heroism as the late Sir Redvers Buller.

FLIGHT

AERONAUTICAL TERMINOLOGY.

To the casual observer, the need for the definition of technical terms is less obvious at the present day than formerly; but in reality, for the dissemination of correct information and in order to avoid confusion which might arise through the employment of loose terminology, the importance of knowing *exactly* what is meant when an expression is used is, if possible, greater now than when we compiled and published our glossary of the terms used in FLIGHT as far back as February, 1909. Progress in every department of aeronautics along scientific lines is continuous, and it is therefore essential to give every term or expression a more or less definite meaning; yet, not infrequently, words are employed that, while often expressive enough for many purposes, are, to say the

"Flight" Copyright.

FROM *FLIGHT* OFFICE WINDOW.—His Majesty's airship "Beta" as she appeared last week flying over St. Martin's Church during one of her regular cruises over London.

least, too wide in their possible meanings, if they are not actually incorrect in themselves when regarded from a scientific standpoint, as well as in their true and original application.

There is, however, still another aspect of the question to which we may refer—the national aspect. Even at the present time, there are various French expressions occasionally used that have been imported into our vocabulary, in many instances, because there are no corresponding English terms obtainable by direct translation, while in others they have gained acceptance purely through use by the French in the very early days of the industry. Their continuance, in the opinion of many, is, however, not desirable, as in most cases they can be replaced by alternative English words which are now growing in number, while, as the pronunciation of the French equivalent is often atrocious, there is ample justification for the substitution of others of English origin wherever possible.

Hence, the sooner the commoner and more technical expressions are defined and given a correct and an authoritative interpretation, the less will be the opportunity for wrong phraseology to gain acceptance through custom or by continued use. The main principle to be borne in mind in formulating these definitions should be, that they are to fix one's ideas; and this, we believe, is the spirit in which the terms, which we publish elsewhere in this issue, have been examined by the Technical Terms Committee of the Aeronautical Society.

This work represents only one of the directions in which the Aeronautical Society is rendering excellent service, and the Committee is to be congratulated upon the work which they have been able to accomplish—a work which is bound to awaken interest and possibly discussion.

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MORE R.F.C. ACTIVITIES.

FURTHER detailed reference as to the work of the Royal Flying Corps at the front was made in an official despatch from General Headquarters, covering the period September 18th to 22nd, and issued by the Press Bureau on the 24th ult. The details are as follows:—

"During the day's (September 18th) fighting an anti-aircraft gun of the Third Army Corps succeeded in bringing down a German aeroplane.

"Another hostile aeroplane was brought down by us, and one of our aviators succeeded in dropping several bombs over the German lines, one incendiary bomb falling with considerable effect on a transport park near La Fère.

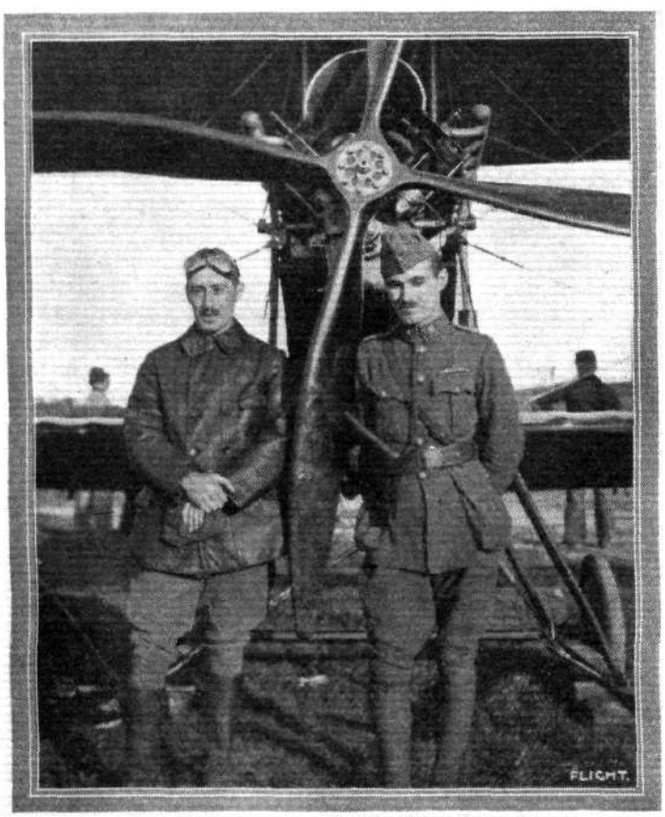


Photo by Capt. Oswald Watt.

OUR FLIGHT OFFICERS AT THE FRONT.—Lieut. Lawrence, R.F.C., and Lieut. Wingfield Smith, R.F.C., with a B.E. at ——.

"Amongst items of news are the following: Recently a pilot and observer of the Royal Flying Corps were forced by a breakage in the aeroplane to descend in the enemy's lines. The pilot managed to "pancake" his machine down to earth, and the two escaped into some thick undergrowth in a wood. The enemy came up and seized the smashed machine, but did not search for our men with much zeal. The latter lay hid till dark, and then found their way to the Aisne, across which they swam, reaching camp in safety, but barefooted."

In an official despatch detailing the operations on September 23rd, and issued by the Press Bureau on September 29th, there was the following:—

"Wednesday, the 23rd, was a perfect autumn day. It passed without incident as regards major operations, though the enemy concentrated their heavy artillery fire upon the plateau near Paissy.

"Nothing more than inconvenience, however, was caused. The welcome absence of wind gave our airmen a chance of which they took full advantage, gathering much information.

"Unfortunately, one of our aviators, who has been particularly active in annoying the enemy by dropping bombs, was wounded in a duel in the air.

"Being alone on a single-seater monoplane, he was not able to use a rifle, and whilst circling above a German two-seater in an endeavour to get within pistol shot, was hit by the observer of the latter, who was armed with a rifle.

"He managed to fly back over our lines, and by great good luck descended close to a motor ambulance, which at once conveyed him to hospital.

"Against this may be set off the fact that another of our fliers exploded a bomb amongst some led artillery horses, killing several and stampeding others.

"On Thursday, the 24th, the fine weather continued, as did the lull in the action, the heavy German shells falling mostly near Pargnan. On both Wednesday and Thursday the weather was so fine that many flights were made by the aviators of the French, the British, and the Germans, producing corresponding activity amongst the anti-aircraft guns. So still and clear was the atmosphere towards evening on Wednesday and during the whole of Thursday that to those not specially on the look-out the presence of aeroplanes high above them was first made known by the bursting of the projectiles aimed at them.

The puffs of smoke from the detonating shell hung in the air for minutes on end like balls of fleecy cotton-wool before they slowly expanded and were dissipated.

"From the places mentioned as being the chief targets for the enemy's heavy howitzers, it will be seen that the Germans are now inclined to concentrate their fire systematically upon definite areas in which their aviators think they have located our guns, or upon villages where it is imagined our troops may be billeted. The result will be to give work to the local builders."

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Aviators' Certificates.

THE following Aviators' Certificates have been granted :—

907 Flight Sub-Lieut. Philip Leslie Holmes, R.N.A.S. (Avro Biplane, Central Flying School, Upavon). Sept. 21st, 1914.

908 John Callaghan Brooke (Blériot Monoplane, Military School, Brooklands). Sept. 21st, 1914.

909 Claude Francis Strickland, I.C.S. (Grahame-White Biplane, Grahame-White School, Hendon). Sept. 22nd, 1914.

910 James Gordon McKinley (Blériot Monoplane, Military School, Brooklands). Sept. 22nd, 1914.

911 Flight Sub-Lieut. Bernard Crossley Meates, R.N.A.S. (Maurice Farman Biplane, Central Flying School, Upavon) Sept. 23rd, 1914.

912 Harry O'Hagan (Blériot Monoplane, Military School, Brooklands). Sept. 23rd, 1914.

913 Oswald Mansell Moullin (Bristol Biplane, Military School, Brooklands). Sept. 24th, 1914.

914 2nd Lieut. Frederick William Polehampton (14th Cavalry Reserve, 15th Hussars) (Grahame-White Biplane, Grahame-White School, Hendon). Sept. 27th, 1914.

B. STEVENSON, Assistant Secretary.

166, Piccadilly, W.

THE ROYAL FLYING CORPS.

THE following promotion from the ranks was announced on the 25th ult :—

R.F.C.—Military Wing.—Sergeant W. W. W. Reilly to be Second Lieutenant.

The following appointment was announced by the Admiralty on the 25th ult. :—

Royal Naval Air Service.—Assistant Paymaster W. B. Hogg, to the "Penelope," additional, for Naval Air Station, Great Yarmouth, to date September 24th.

The following appointments were announced by the Admiralty on the 27th ult. :—

Royal Naval Air Service.—Lieut.-Commander F. C. Halahan, M.V.O., to "President," additional, as Acting Commander, for duty in the Air Department, Admiralty, September 25th.

Flight Lieut. R. E. C. Peirse, to the "Pembroke," additional, for Eastchurch Naval Flying School, September 25th.

Probationary Flight Sub-Lieut. E. V. S. Wilberforce has been confirmed in the rank of Flight Sub-Lieutenant, and appointed to "President," additional, as Assistant Instructor at the Central Flying School, September 25th.

The following appointments were announced by the Admiralty on the 28th ult. :—

Royal Naval Air Service.—Assistant Paymaster F. K. Haskins, to the "Pembroke," additional, for course of instruction at Central Flying School, September 26th.

Flight Lieuts. A. C. Barnaby, H. Fawcett, R. P. Ross, C. E. Maude, F. W. Rowhill, and A. B. Gaskell have been promoted to the rank of Flight Commander, with seniority of September 26th.

The following promotions were announced in the *London Gazette* of the 29th ult. :—

Central Flying School.—Capt. Archibald C. H. MacLean, Royal Scots (Lothian Regt.), a Flight-Commander and an Instructor at the Central Flying School, to be a Squadron-Commander, September 18th, 1914.

R.F.C.—Military Wing.—Officers to be Flying Officers, September 19th, 1914.—Capt. Harry T. Lumsden, Queen's Own Cameron Highlanders, and to be seconded; Capt. John R. C. Heathcote, Queen's Own Cameron Highlanders, and to be seconded.

Royal Naval Air Service.—Probationary Flight-Sub-Lieut. Ernest V. S. Wilberforce has this day, September 25th, been confirmed in the rank of Flight-Sub-Lieut.

The following appointment was announced by the Admiralty on the 29th ult. :—

Royal Naval Air Service.—Gunner G. Bower to the "Pembroke," additional, for Central Air Office (sub-depôt), Sheerness, September 27th.

The following were announced in a special supplement of the *London Gazette* issued on the 30th ult. :—

Central Flying School.—Capt. Archibald C. H. MacLean, Royal Scots (Lothian Regiment), a Flight Commander and an Instructor at the Central Flying School, will be graded as a Squadron Commander, and not as stated in the *Gazette* of September 29th, 1914.

R.F.C. Military Wing.—*Special Reserve of Officers.*—Bentfield C. Hucks and Harold Blackburn to be confirmed in their rank.

The following were announced by the Admiralty on the 30th ult. :—

Acting Flight Lieutenants—L. Tomkinson and G. R. Bromet have been confirmed in the rank of Flight Lieutenant, with seniority of August 1st.

Probationary Flight Sub-Lieutenants—F. M. L. Barr, H. G. Wanklyn, and J. M. R. Cripps, have been confirmed in the rank of Flight Sub-Lieutenant, with seniority of August 1st.

Photo by Capt. Oswald Watt.

OUR FLIGHT OFFICERS AT THE FRONT.—Lieut. James Valentine, R.F.C., with his Blériot at ——.

FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Eastchurch Flying Grounds.

THERE has again been a lot of flying this week, and considerable instruction has been given, the weather being perfect. Two Bristol Tractors, Maurice Farman, Blériot, Deperdussin, three B.Es., 1, 2, 10, 62, 63, 152 Shorts were the machines up. Great activity prevails here, three Royal Aero Club's and one Naval shed being occupied by troops training for service.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Monday, last week, Sub-Lieut. Giles straights with Instructor Manton. Mr. Strickland circuits, &c., and first part of *brevet*.

Tuesday, Messrs. Carabajal, Polehampton and Stalker and Sub-Lieuts. England, Ffield, Giles, Haines, Hart, Perry and Riggall straights with Instructors Manton, Russell and Winter, and afterwards Mr. Polehampton and Sub-Lieuts. Perry and Haines making solo straights. Sub-Lieuts. Allen, Rosher, Strong and Mr. Morgan solo straights. Messrs. Mumby and Wiles solo circuits (Mr. Wiles first part of *brevet*). Mr. Claude Strickland going in for *brevet* tests and gaining R.Ae. Certificate.

Wednesday, Messrs. Carabajal, Easter and Greenwood, and Sub-Lieuts. England, Ffield, Giles, Hart and Riggall straights with Instructors Winter, Manton and Russell. Sub-Lieuts. Allen, Haines, Perry and Rosher solo straights, and Messrs. Morgan, Polehampton, Stalker and Carabajal solo straights. Mr. Mumby and Sub-Lieuts. Rosher and Strong circuits.

Friday, Sub-Lieuts. Allen, Haines and Rosher solo straights. Messrs. Polehampton and Stalker solo straights. Sub-Lieuts. England, Ffield, Giles, Hart and Riggall straights, with Instructors Manton, Shepherd and Winter. Mr. Mumby circuits.

Saturday, Sub-Lieuts. Allen and Riggall solo straights. Sub-Lieuts. Rosher and Strong solo circuits.

Beatty School.—During last week the following pupils were out with Mr. Beatty, receiving instruction on a "dual"-controlled biplane :—Messrs. Virgilio, Hornby, Gardner, Parker, Whitehead, Leeston-Smith, Beynon, MacLachlan, Smith, Moore, Newberry, Bond, Monfea and Lieut. Rimington. During the week-end Mr. Lord flew for his certificate, finishing his tests Sunday evening.

British Caudron School.—Monday, last week, school was out at 6 p.m. under the instruction of R. Desoutter, R. M. Murray and E. Prosser. Pupils rolling, Messrs. Legh, Ivermee, Barfield, Moon, Henderson and Dr. Christie. Mr. Abbott doing straights.

Tuesday, misty until 6.30 a.m. Messrs. Christie, Moon, Legh, Ivermee, Barfield, Henderson and Mr. Abbott doing straights. Passenger flights to Messrs. Moon and Henderson on "60." Evening, pupils rolling, Messrs. Christie, Moon, Legh, Henderson, Barfield, Ivermee, Gunner and Stevens.

Wednesday, misty until 9 a.m. Pupils rolling under the instruction of R. Desoutter, R. M. Murray and E. Prosser, Messrs. Christie, Legh, Ivermee, Barfield Moon, Henderson, and Gunner. Mr. Abbott doing straights. Evening, pupils as above.

Thursday, misty. School at 9 to 10 a.m. under the instruction of R. Desoutter, R. M. Murray and E. Prosser. Messrs. Christie, Legh, Moon, Ivermee, Barfield, Henderson, Gunner and Stevens rolling practice. Mr. Abbott doing straights.

Friday, at 7.30 a.m., Messrs. Abbott, Ivermee, and Legh doing straights. Messrs. Christie and Moon rolling practice. Evening, Messrs. Legh, Stevens and Gunner passenger flights with R. Desoutter on 60 h.p. Caudron. Messrs. Abbott, Legh, Ivermee and Moon doing straights. Messrs. Stevens and Gunner rolling.

Saturday morning, school under the instruction of R. M Murray. R. M. Murray test flight. Messrs. Abbott, Legh, Ivermee and Christie doing straights.

Sunday morning, R. M. Murray test flight. Messrs. Abbott, Moon, Ivermee and Christie doing straights.

Hall School.—Monday last week early morning windy. In evening E. Brynildsen, 3 straights; Rose, 2 straight flights. Tuesday, early morning, E. Brynildsen 18 straights. In evening, J. Rose, 3 straights, E. Brynildsen 3 rolls and 3 straight flights. Wednesday, in morning dense fog. In evening Brynildsen 5 straights. Thursday morning dense fog, windy in evening. Friday morning dense fog, in evening E. Brynildsen 2 straights and 2 straight flights. Saturday, in morning, foggy. In evening, gusty wind; nevertheless, later on E. Brynildsen made 6 straight flights. Sunday evening, J. L. Hall instructing J. Rose, four very good flights and half circuits, landing in *vol plané* on No. 2 Hall tractor biplane.

London and Provincial Aviation Co.—Tuesday last week, out 6 a.m., instructors Warren and Smiles. Test flight by Mr. Warren, 15 minutes. Messrs. White, and Davidson, rolling half an hour each. Evening, out 6 p.m., Mr. Warren reaching 1,000 ft. in four minutes. Messrs. White and Davidson rolling half an hour each. Mr. Smiles two circuits at 500 ft. 23rd, 24th, and 25th, too foggy for practice. Saturday, Mr. Warren test flight 10 minutes. Mr. J. H. Moore, new pupil, rolling practice.

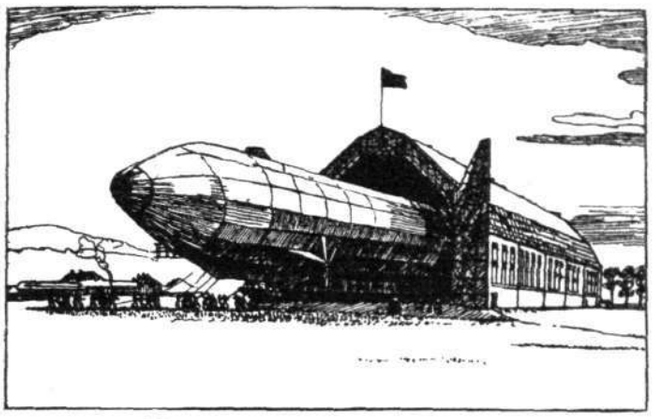
Photo by Louis Noel.

Capt. Oswald Watt (now with the French Army) starting for a flight, with Mr. Wallace Barr as passenger, from the aerodrome at St. Cyr.

FLIGHT

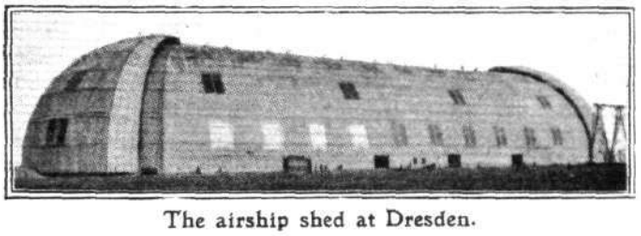
MILITARY AERONAUTICS IN GERMANY.

SOME idea of the extent and thoroughness of military aeronautics in Germany can be gathered from the accompanying map, which we have prepared, and which shows at a glance the location of: (1) airship sheds; (2) flying grounds; (3) aircraft factories; (4) lighthouses for aerial navigation; and in the appended table will be found detailed particulars and dimensions of the various airship sheds noted on the map.



The airship shed at Oos (Baden).

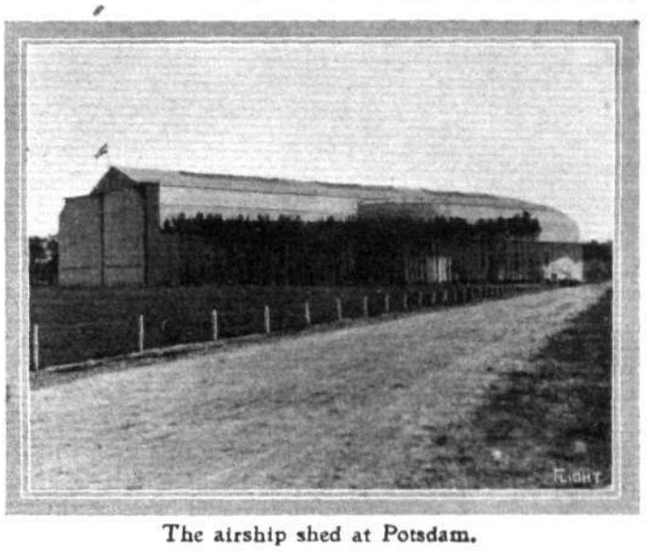
On each side of the map are plans of the majority of recognised German aerodromes and landing grounds, although, of course, it is possible, not to say probable, that several others have been arranged since the commencement of the war. These plans have all been drawn to a uniform scale, from which an idea may be obtained



The airship shed at Dresden.

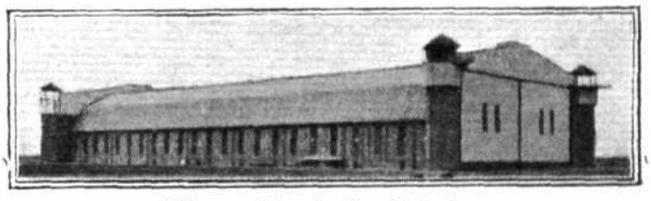
of their relative size, and they have in addition been arranged in the same compass direction, a vertical line indicating N. and S.

A perusal of the accompanying table of airship sheds will show the immense strides made in the construction of these necessary adjuncts to the development of the dirigible for military purposes since the first modest beginning in 1900 with the Zeppelin wooden shed at Manzell on Lake Constance to the recent imposing structures in Ferro-concrete of 600 ft. length, and having accommodation for several modern Zeppelins. A considerable number were, as will be seen from the table,



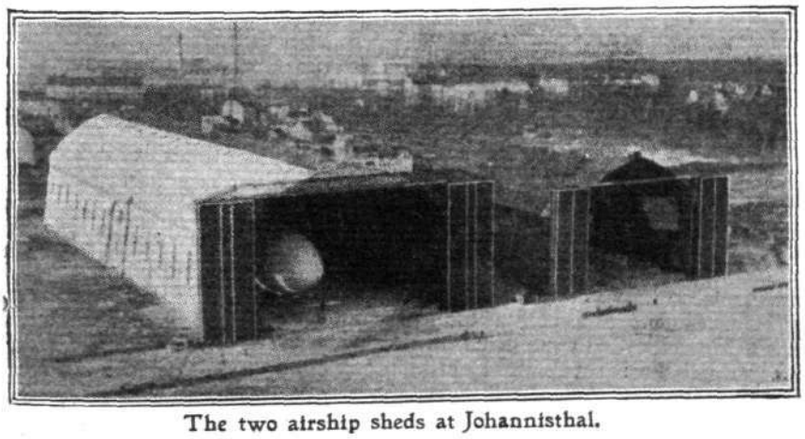
The airship shed at Potsdam.

planned for 1914, and it is to be presumed that the construction of these has been accelerated as much as possible of late, so that, although no particulars have been allowed to transpire, they should probably be included among available airship stations. As to the location of these, it will be seen from the map that they

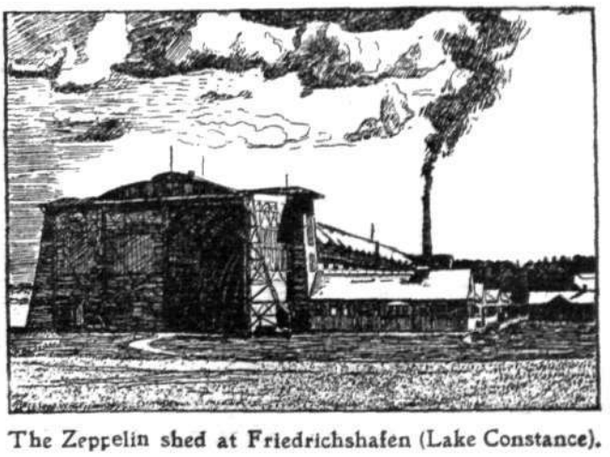


The airship shed at Leipzig.

are chiefly disposed along the eastern and western frontiers, and along the rivers Rhine and Elbe. The proximity of these aerial bases to the frontiers allows of aerial raids of considerable distance into France and Russia, and those situated in the interior are so located as to form intermediate stopping places during transfer of aerial forces from one frontier to another.

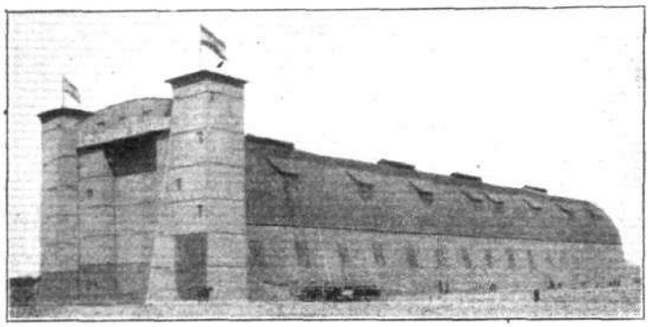


The two airship sheds at Johannisthal.



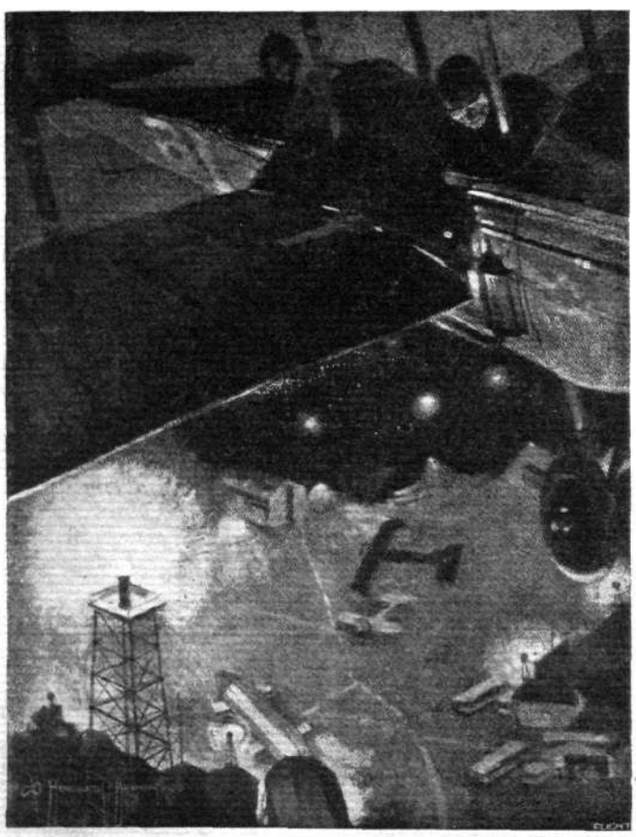
The Zeppelin shed at Friedrichshafen (Lake Constance).

In time of war it is essential that aircraft may be transferred from one place to another in the shortest possible time, and, realising this and the necessity for being able to start and land their aircraft on all their aerodromes on both frontiers at night, the German Government have been working on the problem of night aerial navigation for over a year. To this end what may be called lighthouses or beacons have been erected on



The airship shed at Düsseldorf.

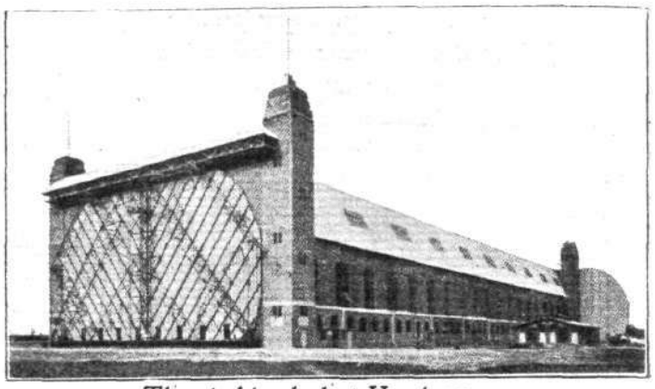
the frontiers and connecting routes, generally in the vicinity of airship sheds or flying grounds. Already twenty-one such lights are in use, and may be divided into three classes as follows :—(1) The very powerful ones, which are to aid the aviator in finding out where he is. (2) The lesser ones which mark obstacles, the presence of which the pilot could not know beforehand, as, for instance, towers and cables. (3) The still weaker beacons which are to aid the pilot in making a landing. After numerous experiments it was found that the best form of light was one in which the intensity of the rays



Beacons for aviators in use as depicted by Mr. Howard V. Brown in the *Scientific American*.

decreases from the horizontal towards the vertical, since in a ground fog the vertical rays have the thinnest layer to penetrate. The two sources of light employed are acetylene and electricity.

As the number of these lighthouses grew, another problem presented itself, *i.e.*, the identification of these



The airship shed at Hamburg.

beacons. Coloured glasses were tried, but had to be discarded on account of the fact that they absorbed a large amount of light. The only cases in which red glasses have been retained are for landing lights. For the other beacons the method employed in marine lighthouses has been adopted, and these are identified by the characteristics of the light, which is either fixed, revolving, or flashlight. Another class, called "Morse beacons" on account of the fact that they throw out flashes of varying length, thus transmitting Morse signals, are in use in certain cases.

The arrangement employed for landing beacons is highly ingenious, as it shows the pilot not only where to land, but also what is the direction of the wind. They are sunk into the ground of the aerodrome and covered with a thick glass sufficiently strong for an aeroplane to land on it. A large white light is set in the centre of the aerodrome. At a distance of 80 metres from this are placed four red lights representing the four cardinal points of the compass. These red lights are connected by a subterranean channel to a series of contacts worked by a vane. At night time, when the beacon is in use, only the central white light and one or two of the red lights are in action. If the wind is north the red light to the north of the central light burns. If the wind is north-east the red lights to the north and east are lighted. Should the wind veer round to a different quarter the vane turns with it and breaks contact with the red lights that were previously burning and makes contact with the lights corresponding to the new wind direction. In a calm only the central white light is burning. In this way the aviator is informed of the direction of the wind close to the ground, and can land into it, or if he sees no red lights, he knows that there is no ground wind to consider.

According to *l'Aerophile* twenty-one of these beacons were in operation on April 1st, 1914, their characteristics being as follows :—

1. Belgern-on-the-Elbe, in Prussian Saxony : revolving electric light flashing once in every 1·5 seconds, 72 metres above ground, 150 millimetres focal distance, 7,000 candle-power ; gives warning of high tension cables, in course of construction. 2. Bernkastel-Kues : revolving electric light giving two flashes, 425 metres above sea level, 150 millimetres focal distance,

250,000 candle-power; opened in March, and shows where aerodrome is. 3. Bonn: fixed electric light with Fresnel lens or circular disk of stepped prisms, 25 meters above ground, 8,500 candle-power; gives by series of flashes the number of the station; belongs to the municipality. 4. Döberitz: revolving acetylene light flashing every 3 seconds, 50 metres above ground, 250 millimetres focal distance, 27,000 candle-power; belongs to the military aerodrome, and is soon to be lighted by electricity with much higher candle-power. 5. Kaditz, near Dresden: revolving electric light with two flashes in 9 seconds, 46 metres above ground, 250 millimetres focal distance, 250,000 candle-power; shows the aerodrome at Kaditz. 6. Eilvese, near Neustadt, in Hanover: wireless station; revolving electric light flashing every 4 seconds, 22 metres above ground, 300,000 candle-power; indicates the tower of the T. S. F. station. 7. Gotha: fixed electric light with Fresnel lens, 22 metres above ground, 30,000 candle-power; indicates by flashes the number of the station; belongs to the Gotha carriage factory. 8. Grosser Feldberg, in the Taunus Mountains: fixed electric light, 910 metres above sea level, 800,000 candle-power, which will be raised much higher; was to be opened in April. 9. Johannisthal,

GERMAN AIRSHIP SHEDS.

Place and Year of Building.	Inside Length.	Inside Width.	Inside Height.	Direction.	No. of Doors.	Material.	Owner and Remarks.
	ft.	ft.	ft.				
Aachen	—	—	—	—	—	—	Planned for 1914.
Allenstein	—	—	—	—	—	—	Planned for 1914.
Bickendorf (Cologne), 1909 ...	492	164	90	—	1 sliding door	Iron	Prussian War Office.
Biesdorf (Berlin), 1909 ...	443	82	82	Rotatable	1 curtain	,,	Siemens-Schuckert.
Bitterfeld, 1908	256	82	72	E.W.	,,	Wood	Aircraft Co.
Bitterfeld, 1909	328	108	81	E.W.	,,	,,	Aircraft Co.
Brunswick (under construction)	590	115	92	—	2	Iron and stone	Aircraft Co. To be finished 1914.
Cöln-Nipper	131	52	41	E.W.	1 sliding	Wood	Franz Clouth.
Cuxhafen (under construction)	590	245	98	Rotatable	—	Iron	Imperial Navy.
Dresden	626	190	92	E.W.	2 revolving	Iron framework, wood covered	Dresden City.
Düsseldorf, 1910	498	82	79	S.W. N.E.	1 sliding door, 1 curtain	Wood	Düsseldorf City.
Frankfurt a. M., 1911 ...	525	98	79	S.W. N.E.	2	Iron	Delag.*
Friedrichshafen, 1908 ...	585	151	66	E.W.	2	,,	Zeppelin Airship Works.
Fuhlsbüttel (Hamburg), 1911	525	148	85	W. by S. E. by N.	2 sliding	,,	Hamburger Luftschiffhafen.
Gotha, 1910	512	85	85	E.W.	1 sliding	Wood	Gotha City.
Graudenz	—	—	—	—	—	—	Planned for 1914.
Hanover	—	—	—	—	—	—	Planned for 1914.
Heligoland	—	—	—	Rotatable and disappearing	—	—	Imperial Navy.
Johannisthal (Berlin), 1910 ...	270	82	82	N.W., S.E.	1 sliding	Wood	Luftfahrb-Betriebs-Ges.
Johannisthal (Berlin), 1911 ...	533	148	93	N.W., S.E.	,,	,,	Luftfahrb-Betriebs-Ges.
Kiel, 1910	558	98	84	N.E. S.W.	1 curtain	,,	Verein für Motorluftschiffart i. d. Noordmark.
Königsberg, 1911	558	134	124	—	—	Iron	Prussian War Office.
Lahr	—	—	—	—	—	—	To be finished October 1st, 1914.
Leichlingen, 1909	262	75	79	N.E., S.W.	Curtain	Wood	Rhein Werft Motorluftschiff Ges.
Leipzig	633	197	82	N.N.E. S.S.W.	2 sliding	Ferro-concrete	Leipzig Luftschiffhafen u. Flugsplatz.
Liegnitz, 1913	—	—	—	—	—	—	Prussian War Office.
Manzell, 1900	460	82	—	—	—	Wood	Zeppelin Airship Works. Used as workshops by the Friedrichshafen Aircraft Works.
Metz, 1909	492	132	85	—	—	Iron	Prussian War Office.
Oos (Baden), 1910	520	82	79	S.W. N.E.	1	,,	Delag.*
Potsdam, 1911	553	164	82	W.S.W. E.N.E.	—	,,	Zeppelin Airship Works.
Posen	—	—	—	—	—	—	Proposed.
Rheinan (Mannheim), 1909...	450	85	81	N.S.	Curtain	Wood and iron	Schütte-Lanz Airship Works.
Schneidemühl...	—	—	—	—	—	—	Proposed.
Straszburg, 1910	492	92	82	—	—	—	Prussian War Office.
Tegel (Berlin), 1906	262	82	72	N.E. S.W.	Curtain	Wood	Motorluftschiff - Studiengesellschaft. Used for aerodynamic experiments.
Tegel (Berlin), 1905	164	59	—	N.E. S.W.	1 sliding	Iron	Prussian War Office.
Tegel (Berlin), 1907	230	72	—	N.E. S.W.	,,	,,	Prussian War Office.
Tegel (Berlin), 1908–10 ...	332	82	82	N.E. S.W.	,,	,,	Prussian War Office. Enlarged in 1910.
Thorn, 1912	—	—	—	—	—	—	Prussian War Office.
4 transportable sheds... ...	262	82	82	—	—	Canvas	Prussian War Office. Can be erected by 150 men in 24 hours.
Treves (Trier)	—	—	—	—	—	—	Prussian War Office.
Wanne, 1912	285	105	92	N.N.E. S.S.W.	1 curtain	Iron and wood	Rhein.-Westfäl. Flug-und Sportsplatz.

* Deutsche Luftschiffahrts-Aktien-Gesellschaft.

GERMANY'S GREAT AIRCRAFT ORGANISATION.—On our map are shown the various airship sh
Berlin being shown separately on an enlarged scale. The silhouettes on either side of the map, numbered 1 to 30,
the circles indicating the flying grounds. They are all drawn to the same scale, and therefore give a very good ide
the aircraft factories, an alphabetical list is given of t

REFERENCES

AIRSHIP SHEDS ▲

AIRCRAFT FACTORIES ■

FLYING GROUNDS ③

AERO BEACONS:-

REVOLVING LIGHTS

FIXED LIGHTS

MORSE LIGHTS

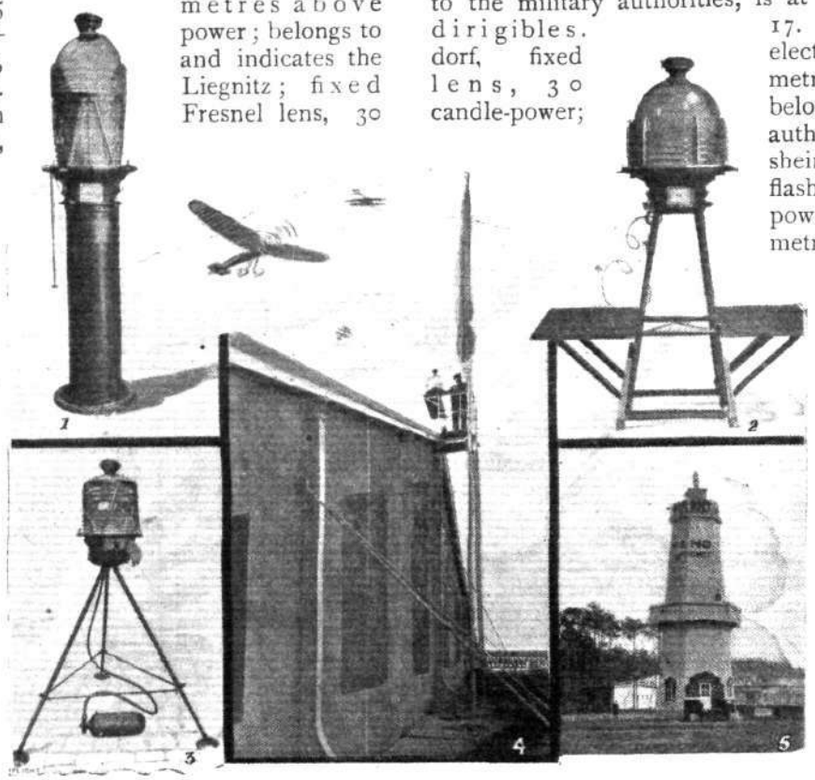
FORTIFIED PLACES

Types of aeroplanes and where manufactured.

Berlin ...	Sommer	Johannisthal	Ago
	Union		Albatros
Essen ...	Kondor		Jeannin
Erfurt ...	Schwade		Rumpler
Frankfort	Euler		Harlan
Friedrichshafen	F.F.		L.V.G.
Gotha ...	Gotha	Leipzig ...	D.F.W.
Halberstadt ...	Halberstadt	Liebau ...	Etrich
Hamburg ...	Hansa	Mainz ...	Gedecker
Hanover ...	Jatho	Munich ...	Otto
Hennigsdorf ...	A.E.G.	Mulhausen ...	Aviatik
		Reinickendorf (Berlin)	L.F.G. Roland
		Schwerin ...	Fokker

s, aircraft factories, flying grounds, aero beacons, &c., with their approximate positions in Germany, the environs of ow the shapes of the various flying grounds. These can be identified by reference to the numbers on the map in f their approximate size, and they are all placed in position as indicated by the arrow pointing N. In regard to towns where manufactured and of the various types.

near Berlin: fixed electric light with Fresnel lens, 25 metres above ground, 30,000 candle-power, indicates by flashes the number of the station; only used when required. 10. Königsberg: fixed acetylene flash light with Fresnel lens, 15 metres above ground, 1,300 candle-power; belongs to and indicates the military authorities, Liegnitz; fixed shed for dirigibles. 11. Fresnel lens, 30 electric light with metres above ground, 8,500 candle-power; flashes give the number of the stations; belongs to the military authorities, and indicates the shed for dirigibles. 12. Lindenberg, near Berlin: Morse beacon of nine lamps with metal filaments having together 3,600 candle-power, 130 metres above sea level; gives by flashes the letter L, at the Lindenberg Meteorological Observatory. 13. Metz: fixed acetylene flash light, Fresnel lens, 30 metres above ground, 1,200 c.p.; belongs to the military, and indicates the dirigible shed. 14. Nauen: wireless station; Morse beacon with filament lamp of 1,000 c.p., 180 metres above ground; gives letter N in flashes; shows large tower of the T. S. F. 15. Posen: fixed acetylene flash light, Fresnel lens, 15 metres above ground, 1,800 c.p.; belongs to the military authorities, and is on the field for manœuvres. 16. Posen: fixed electric light, Fresnel lens, 30 metres above ground, 8,500 candle-power; flashes give number of the station; belongs to the military authorities, is at the Wimarg shed for dirigibles. 17. Berlin, at Reinickendorf, fixed electric flash light, Fresnel lens, 30 metres above ground, 1,200 candle-power; belongs to the military authorities. 18. Schleissheim, near Munich: fixed flash light, 2,500 candle-power, can be raised to 30 metres above ground; belongs to the military authorities. 19. Strasburg: fixed acetylene light, Fresnel lens, 2,500 candle-power; flashes give number of station; at the aerodrome, and belongs to the military authorities. 20. Tegel, near Berlin: revolving acetylene flash light, 50 metres above sea level, 150 millimetres focal distance, 2,000 candle-power; belongs to the Second Battalion of the Aviation Corps. 21. Weimar: revolving electric flash light, 15 metres above the aerodrome, 27,200,000 candle-power; placed at the disposal of the Aviation Society of Weimar by its owner, the Carl Zeiss Company of Jena; works when required.



GERMAN LIGHTHOUSES FOR AERIAL NAVIGATION.—(1) An electrical beacon for night guidance. (2) The beacon used at Johannisthal, near Berlin. (3) A portable military gas beacon. (4) The beacon used at Potsdam. (5) The Johannisthal Aerodrome lighthouse.

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Mr. Harold Perrin at the Front.

To those of our readers who know the good work for the cause of aviation which Mr. Harold Perrin has done as secretary of the Royal Aero Club, it came as no surprise that his abilities—which, it way be recalled, some time ago earned the warmest commendation of the Government—were to be employed in the service of the country. As announced in FLIGHT last week, Mr. Perrin has been granted a temporary commission as Lieutenant in the Royal Naval Volunteer Reserve for duty in connection with the motor vehicles attached to the Royal Naval Air Service, and he has already left for the front. He takes with him the good wishes of the members of the Royal Aero Club, as well as of the host of friends he has made, and one and all will look forward to welcoming him back to his old quarters.

The R.F.C. at the Front.

WHILE in France recently in connection with the delivery of some of the materials for the manufacture of Cellon, Mr. A. J. A. Wallace Barr gathered some interesting information regarding the experiences of some of the R.F.C. officers, but a good many of the items cannot be published, for obvious reasons, at the present time. He obtained confirmation of the story of Lieut. Spratt's successful "bag" of a German aviator, to which reference was made in our issue of Sept. 18th, except that Lieut. Spratt did not, as a matter of fact, have to resort to pancaking on top of the German machine. Mr. Wallace Barr also heard that one of the R.F.C. air mechanics, whose name could not be ascertained, had been awarded the Cross of the Legion of Honour for special bravery. The Avro biplanes appear to be giving a particularly good account of themselves under the very rough treatment which is the lot of an aeroplane on active service.

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The Closing of Brooklands.

OWING to the exigencies of military requirements the general public will not be admitted, until further notice, to the Brooklands Motor Course and Flying Ground after Wednesday, September 30th, 1914.

Members of the Brooklands Automobile Racing Club, Brooklands Lawn Tennis Club, and British Motor Cycle Racing Club, as well as holders of permanent passes, will continue to be admitted subject to the conditions heretofore in force.

Applications for tests and speed trials should be addressed to the Secretary of the Brooklands Automobile Racing Club at Carlton House, Regent Street, London, S.W., who will make arrangements if military requirements permit.

FLIGHT

AERONAUTICAL TERMINOLOGY.

REPORT OF THE TECHNICAL TERMS COMMITTEE OF THE AERONAUTICAL SOCIETY OF GREAT BRITAIN, SEPTEMBER, 1914.

THE need having become pressing for an extension of the preliminary list of Technical Terms published by the Society in 1910, a representative Committee, upon which the Air Departments of the Admiralty and the War Office are officially represented, has been appointed to deal with the matter. It has been decided to publish as an instalment the list of terms annexed hereto. The absence of terms dealing with Stability in the present list is due to the fact that a comprehensive set of such terms, together with others, is under consideration and will be published in due course.

Aerofoil—A structure, analogous to the wing or tail of a bird, designed to obtain a reaction from the air approximately at right angles to the direction of its motion.

Airscrew—Used as a generic term to include both a propeller and a tractor screw. See "Screw."

Aileron—See "Balancing Flap."

Alighting Carriage—See "Carriage."

Angle, Dihedral (* 1 and 9)—In geometry the angle between two planes. The wings of an aeroplane are said to be at a dihedral angle when both right and left wings are upwardly or downwardly inclined to a horizontal transverse line. The angle is measured by the inclination of each wing to the horizontal. If the inclination is upward the angle is said to be positive, if downward, negative.

Angle, Gliding (* 10)—The angle between the horizontal and the path along which an aeroplane, in ordinary flying attitude, but not under engine power, descends in still air.

Angle of Incidence or Angle of Attack (* 6)—The angle a wing makes with the direction of its motion relative to the air. The angle is usually measured between the chord of the wing and the direction of motion.

Attitude—An aeroplane's or wing's position relative to the direction of motion through the air.

Back, To—Of the wind, to change direction counter-sunwise (counter-clockwise).

Balancing Flaps (* 2)—Aerofoils used for causing an aeroplane to roll about its longitudinal axis for the purpose of balancing.

Ballonet—A word taken from the French meaning "a little balloon" and exclusively limited to an interior bag containing air, within the envelope of an airship.

Bank, To (* 10)—To heel for the purpose of turning.

Body (* 1 and 2)—Of an aeroplane—that part which usually contains the engine, crew, tanks, &c., and to which the wings, carriage, and other organs are attached.

Bracing (* 2)—A system of struts and ties to transfer a force from one point to another.

Cabane (* 1)—A French word to denote the mast structure projecting above the body to which the top load wires of a monoplane are attached.

Cabré (* 10)—Tail-down.

Camber (of a wing section) (* 6)—The convexity of a wing section. The camber is usually measured (as a fraction of the chord) by the maximum height above the chord.

Cant, To—To tilt; to take any inclined position.

Carriage (* 1 and 2)—That part of the aircraft beneath the body intended for its support on land or water and to absorb the shock of alighting.

Chassis—See "Carriage."

Chord (* 6)—The straight line (taken conventionally fore and aft unless otherwise specified) touching the under surface of an aerofoil at or near the leading and trailing edges. The length of the chord is the projected length of the section on the chord.

Clinometer—See "Inclinometer."

Control Lever (* 1)—On an aeroplane, a lever by means of which the principal controls are worked. It usually controls pitching and rolling.

Cross Section (of an Aerofoil) (* 6)—The section cut by a fore and aft plane normal to the surface (commonly the under surface).

Dihedral Angle—See under "Angle."

Dive (* 10)—To descend steeply with the nose of the aircraft down.

Dope, To—Of fabrics—to paint a fabric with a fluid substance for the purpose of tightening and protecting it.

Drag (* 7)—The resistance along the line of flight; the head resistance. Compare "Drift."

Drift, To—To be carried by a current of air or water; to make leeway.

Drift—The distance drifted. The speed of drifting. The word "drift" having a well accepted nautical significance should be avoided as far as possible in the sense of "head resistance" or "drag."

Elevator (* 1)—An aerofoil set in a more or less horizontal plane and hinged on an athwartships or transverse line. It is used for controlling the angle of incidence of the aeroplane.

Entering Edge—See "Leading Edge."

Fairing (* 4)—A piece added to any structure to reduce its head resistance or drag.

Fins (* 1)—Subsidiary aerofoils set parallel to the normal direction of motion of an aircraft.

Flaps, Balancing—See under "Balancing."

Flaps, Wing—See under "Balancing."

Fuselage—See under "Body."

Gap (* 2)—The distance between the upper and lower wings of a biplane. For specific purposes the points between which it is measured should be indicated.

Glide, To—To fly, usually on a descending path, when the aircraft is not under engine power.

Gliding Angle—See under "Angle."

Incidence, Angle of—See under "Angle."

Inclinometer—An instrument for measuring the angle of slope of an aircraft, referred to the horizontal.

Leading Edge (* 1)—Of a wing—the forward edge.

Leeward—Away from the wind.

Leeway—Lateral drift to leeward.

Lift (* 7)—The force exerted by the air on an aerofoil in a direction perpendicularly or nearly so to the motion. Usually upwards in ordinary flight.

Longitudinals (* 2)—Of an aeroplane, the long fore and aft spars connecting the main with the subsidiary supporting or controlling surfaces.

Longeron—See "Longitudinal."

Pancake, To (* 10)—To descend steeply, with the wings at a very large angle of incidence, like a parachute. Contrast "Dive."

Pitch, To (* 10)—To plunge in the fore and aft direction (nose up or nose down). Contrast this with "Roll."

Pitot Tube—A tube with open end facing the wind, which, combined with a static pressure or suction tube, is used in conjunction with a gauge to measure fluid pressure or velocities.

Pressure Head—A combination of pitot tube and static pressure or suction tube, which, in conjunction with a gauge, is used to measure fluid pressures or velocities.

Pressure Tube, Static—A tube (usually with holes in its sides past which the fluid flows) so designed that the pressure inside it equals the pressure exerted by the fluid on any body at rest in the fluid. Used as part of a pressure head.

Propeller (* 2)—An air-screw behind the main supporting surfaces. Compare "Tractor."

Pylon (* 1)—A mast or post.

Rib (* 1 and 3)—Of a wing, a light fore and aft member which carries the fabric for the purpose of giving the desired cross section to the wing.

Rib, Compression—A rib designed to act as a strut between front and rear spars of a wing.

Roll, To—To turn about the fore and aft axis.

Rudder (* 1)—A subsidiary aerofoil (in an aeroplane more or less perpendicular to the main supporting surfaces) by means of which an aircraft is turned to right or left.

Rudder Post (* 1)—The main post of a rudder.

Rudder Bar (* 1)—The foot-bar, by means of which the rudder of an aeroplane is worked.

Screw, Air—An aerofoil so shaped that its rotation about an axis produces a force along that axis for driving an aircraft.

Side Drift—See "Drift."

Side Slip, To—In an aircraft, to move more or less broadside on relatively to the air.

Skid (* 1 and 2)—A part of the alighting gear of an aircraft arranged to slide along the ground.

Span, of Wings (* 2)—The distance from wing tip to wing tip.

Span, of Aeroplanes (* 2)—The maximum transverse dimension.

Spar (* 1)—A long piece of timber or other material. In a wing, either of the beams which run transversely to the aircraft, and transfer the lift from the ribs to the frame and bracing.

Stagger (* 2)—Of wings. When the wings of a biplane are set with the upper one slightly ahead of, or abaft of the other, they are said to be staggered. The stagger is measured by the angle

* The asterisk in brackets denotes that the term is illustrated, and the number indicates the figure in which it is illustrated.

AERONAUTICAL TERMINOLOGY.

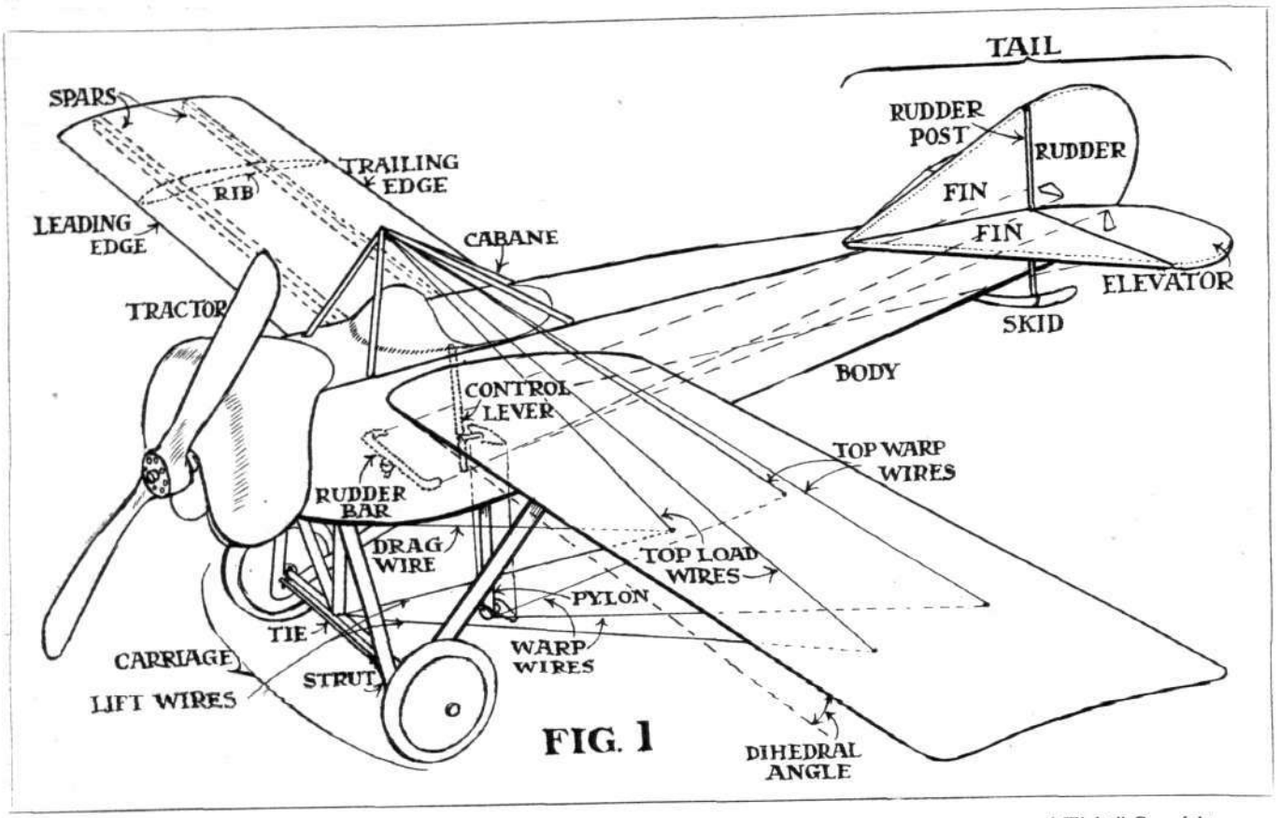


FIG. 1

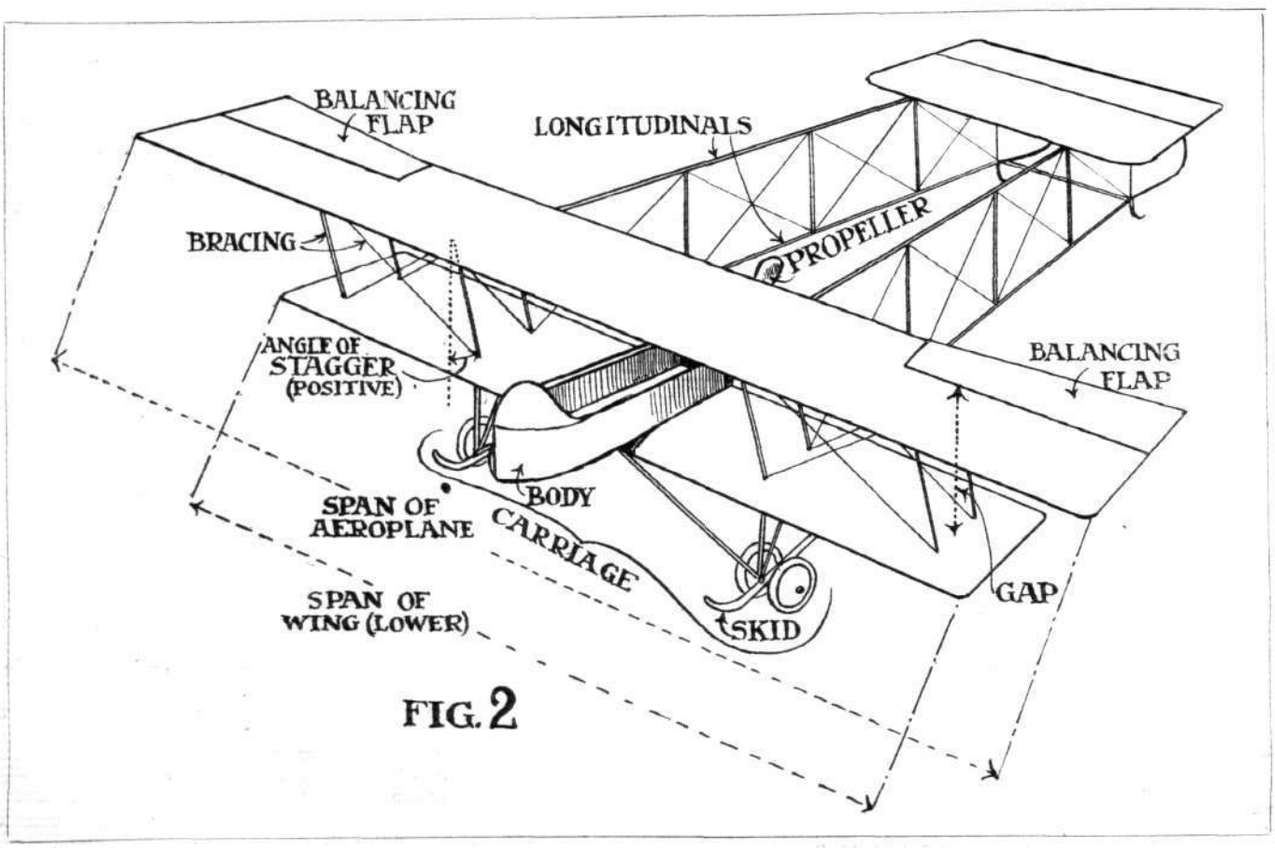
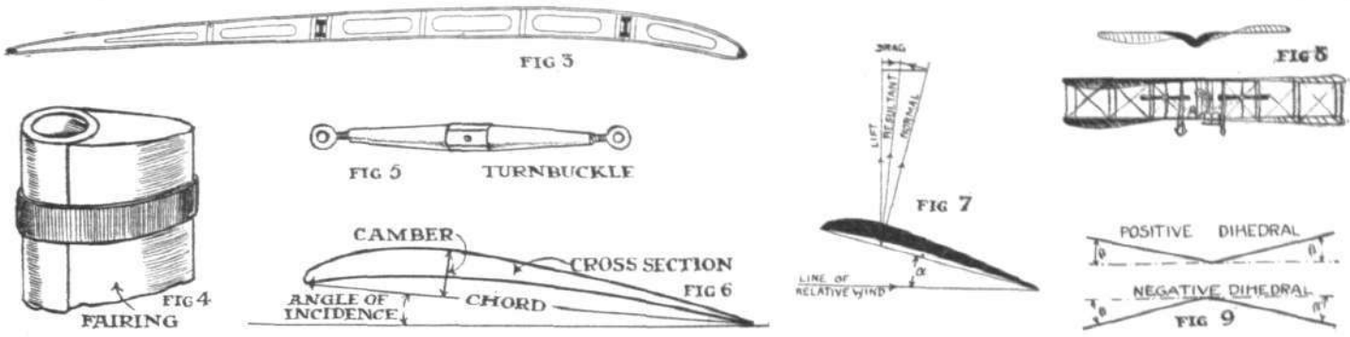


FIG. 2

Figs. 1 and 2.—Illustrating various terms appearing in the report by the Aeronautical Society of Great Britain.



Figs. 3 to 9.—Aeronautical terminology.

made by the line joining the leading edges with the normal to the fore and aft axis of the aeroplane. It is convenient to call the stagger positive if the upper wing is ahead of the lower.

Static Pressure Tube—See under "Pressure."

Statoscope—An instrument to detect the existence of a small rate of ascent or descent.

Strainer—An appliance bearing a suitable mesh for straining impurities from petrol and other fluids. Also compare "turnbuckle."

Stream-line—The path of a small portion of a fluid, supposed continuous, moving relatively to a solid body. The term is commonly used only of such paths as are not eddying, but the distinction should be made clear by the context.

Strut (* 1 and 2)—A structural member intended to resist compression in the direction of its length.

Tail (* 1)—The after part of an aircraft, usually carrying certain controlling organs.

Tie (* 1)—A structural member intended to resist tension.

Top Surface Camber—See under "Camber."

Top Load Wires—See under "Wires."

Top Warp Wires—See under "Wires."

Tractor (* 1)—An air-screw mounted in front of the main supporting surfaces.

Tractor Machine (* 1)—An aeroplane with air-screw mounted in front of the main supporting surfaces.

Trailing Edge, of a Wing (* 1)—The after edge.

Turnbuckle (* 5)—A form of wire tightener.

Under-Carriage—See "Carriage."

Under-Surface-Camber—See "Camber."

Veer, of the Wind—To change direction sunwise (clockwise).

Velocity of Sideslip—The speed with which the craft moves broadside on with respect to the air. Distinguish from "drift," q.v.

Warp, To (* 8)—Of a wing, to bend so that the outer end of the back spar moves up or down. It is convenient to call the warp positive when the movement is downwards.

Wing Flaps—See "Balancing Flaps."

Wings—The main supporting organs of an aeroplane. A monoplane has two wings, a biplane four.

Wires, Lift (* 1)—Wires, the principal function of which is to transfer the lift of the wings to the body or other part of the aeroplane structure.

Wires, Warp (* 1)—Lift wires connected to the back spar and controlled so as to move its outer end down for the purpose of warping the wing.

Wires, Top Load (* 1)—Wires intended mainly to resist forces in the opposite direction to the lift.

Wires, Top Warp (* 1)—Top load wires connected to the back spar and passing from wing to wing to allow the wings to warp.

Wires, Drag (* 1)—Wires, the principal function of which is to transfer the drag of the wings to the body or other part of the aeroplane structure. Wires intended mainly to resist forces in the opposite direction to the drag are sometimes called "anti-drag wires."

Wires, Drift—See "Wires, Drag."

Wire-Strainer—See "Turnbuckle."

Yaw, To—An aircraft is said to yaw when its fore and aft axis turns to right or left out of the line of flight. The angle of yaw is the angle between the fore and aft axis of the aircraft and the instantaneous line of flight.

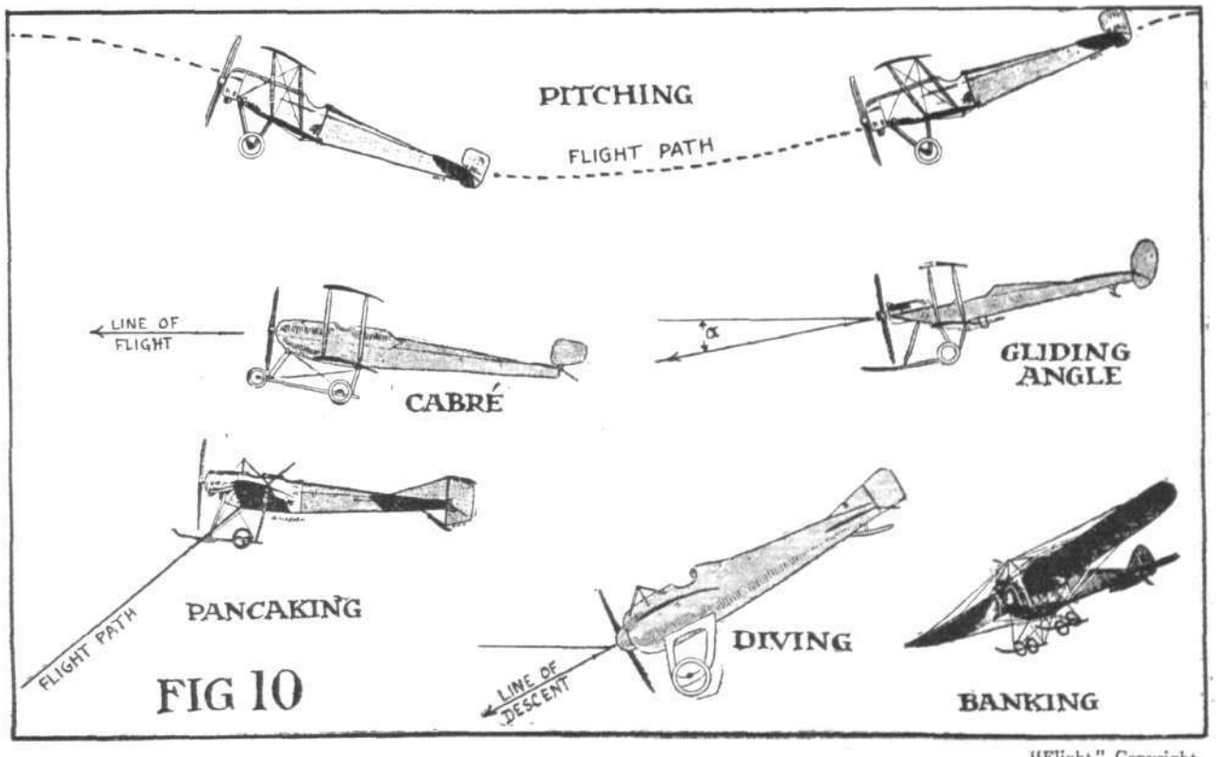


Fig. 10.—Aeronautical termino'ogy.

AIRCRAFT AND THE WAR.

ELSEWHERE in this issue will be found extracts from the official despatches from the front, showing that highly valuable work has been accomplished by the officers of the Royal Flying Corps. From other sources have come details of other exploits by the flight officers attached to the different armies, while another voyage of destruction by a Zeppelin has to be recorded, Ostend being the target on the 24th ult. The story of its work is thus told by *The Times* correspondent :—

"An airship, believed to be a Zeppelin, circled over Ostend late last night, dropping bombs as it went. So far as can now be ascertained, four bombs were dropped in all.

"The first fell harmlessly in the Bois de Boulogne ; the second more harmlessly in the sea. The third hit the fish market (la Minque), which was, of course, at that time of night deserted, and smashed a considerable quantity of lath and plaster into splinters and dust. The fourth buried itself in the turf of a garden adjoining the station, digging a deep hole. The explosion broke some glass in the station and threw one goods truck off the rails of a siding. It is uncertain whether more bombs fell, but only three apparently exploded.

"A good deal of glass was shattered in neighbouring buildings, and telegraph wires were broken down, but no one was hurt and the total damage does not amount to more than a few pounds.

"It was a few minutes past 11 when the airship arrived. The last bomb was dropped about 11.20. I was in the street before the bomb fell in the market, 300 or 400 yards away, but cannot say that I saw anything passing through the air. Nor, though the night was very clear and the drumming of the airship's engines seemed directly overhead and was very loud (much louder than that made by any aeroplane), was I or any one of those with me able to distinguish it against the starlit sky.

"Close to the place where the bombs dropped in the fish market a heavy woollen khaki-coloured blanket, bound with white, some 7ft. or 8ft. long and 3ft. wide, fell and was caught on the telegraph wires, whence a gendarme, 15 minutes later, dislodged it with a long pole. One corner of the blanket had recently been cut off—perhaps a hand's length of it, and it is assumed that the bomb was dropped wrapped in the blanket. Perhaps it had been carried along in it and had been released by cutting the fabric. Perhaps the blanket is part of an arrangement for delaying or steadying its descent. Experts can doubtless say.

"For some minutes, as the airship receded, after the bombs were dropped, there continued a series of flashes, not unlike miniature lightning flashes, at no great height in the air, of which no one seems to be able to offer an explanation, though everybody who was out of doors saw them. One appeared to be within 50 yards of me and looked as if some chemical powder or gas was igniting in the air hardly above the level of the house-tops. It suggested the "golden rain" in a display of fireworks, but was very evanescent.

"The airship returned in the direction whence it came. It was reported as passing over Thielt at 11.40 or thereabouts and Courtrai at 11.55."

A later message stated that one of the bombs fell near the sleeping carriage depôt. Two rails each weighing 52 kilograms were torn up, twisted, broken and hurled a distance of 250 metres. It is also stated that pieces of a bomb were found on the Belgian mail steamer "Leopold II." As to the bombs, two of which were found unexploded at Waereghem, they were described as 21 cm. (about 8¼ ins.) in diameter and 1·2 metres (about 4 feet long). They are made of steel with a red copper cap and charged with picric acid. On account of this visit orders were issued that no light should be shown after dark in Flanders and Campine.

Calais and Boulogne also received attention from the enemy aircraft, but this time it was a Taube, which it is reported was later shot down at Abbeville. It passed over Calais at an exceedingly high altitude and dropped three bombs according to the *Daily Telegraph*.

"The first fell in the Rue des Quatre-Coins, on the verandah of a doctor's house. It landed in a baby's mail-cart, and did not explode. The nurse, who was in the room near the verandah heard the hissing made by the fuse, which, however, went out very shortly after touching the cart.

"The second bomb fell in the Fort Nieulay. Beyond making a hole in the paved ground no further damage was done. The last bomb fell at Frethun, on the outskirts of the town. No serious damage was done.

"An officer of the French artillery went during the afternoon and took away the unexploded bomb. No loss of life or injury to anybody is reported."

A message from Boulogne stated that the aeroplane flying at a very great height was seen over Boulogne.

"When well over the town it dropped a bomb, which fell in the front entrance of a house situated in the Rue Dr. de Buchenne. Fortunately no one was hurt.

"The neighbouring houses suffered a great shock, and all their windows were broken.

"A large but calm and collected crowd gathered round the scene."

Wiring from Petrograd on September 25th the *Daily Telegraph* correspondent said :—

"A couple of railway trucks have brought to Petrograd the remains of a Zeppelin airship which was brought down from a great height by Russian artillery fire. The greater part of the envelope was destroyed by the explosion of gas which it contained, but the car, with its fittings and four propellers, are in a state of comparatively good repair.

"It is not clear whether this is one of the two Zeppelins the destruction of which on this front had already been reported, or whether it is an additional loss to the aerial fleet that, according to German views, was to play so important a part in the world war.

"If, however, as is stated, it was shot down in the dead of night, then it is apparently a third airship of this type that the Russians have bagged, as the two captures reported at the time of their occurrence had evidently taken place during the day."

A message from Denderleeuw (Belgium) stated that on the evening of the 24th a Belgian biplane, making a reconnaissance over Brussels, was attacked by a German monoplane. The two machines went up to a great altitude and shots were exchanged. Eventually the Taube turned over and fell, while the biplane returned towards Antwerp.

Another bomb-dropping cruise by a Zeppelin was made on Saturday, and its progress was thus described by the Exchange Telegraph Co.'s correspondent :—

"A Zeppelin, which I believe started from Brussels and passed over Denderleeuw, was at 10.25 last night over Sotteghem.

"Then going in the direction of Mierelbeke to Wite and Ghent, it threw five bombs, of which two exploded. They all fell in the vicinity of a hospital, two alighting on the roof. Considerable damage was done, and an old man aged 82 was mortally injured.

"The Zeppelin shaped a course towards Rolleghem, where it threw another bomb, but did not do any damage this time. Continuing its destructive career in the direction of Thielt two bombs were hurled at a gas factory, and further material damage resulted.

"At midnight the Zeppelin was over Wyngbene, and thence proceeded to Sichtervelde, Roulers, Courtrai, and Mousoron, in the direction of France."

A message from Warsaw states that a Zeppelin which dropped bombs near the railway station on Saturday was twice hit by gun fire. After dropping the bombs, which wounded three soldiers, it endeavoured to escape, though crippled, in the direction of the fortress of Novo Georgievsk, which lies to the north of Warsaw. Here it was again struck and brought to the ground.

On Saturday morning a German aeroplane appeared over Duffel, near Antwerp, and dropped two bombs, which fell into the water.

In the afternoon another German aeroplane flew over Antwerp, but on the forts opening fire with shrapnel the aviator was obliged to ascend to a great height and disappeared.

At Hal, near Brussels, a German aviator in a Taube was brought down by an English airman, and was killed, the machine being smashed.

It was also reported from Antwerp that Lord Carbery, who is now attached to the Royal Naval Air Service, had

met with an accident while flying with Prince Henri de Ligne. Apparently the machine had to be brought down suddenly, owing to the engine misfiring, and it failed to clear a tree. Lord Carbery was injured in the leg and the Prince hurt his foot, but it is reported that neither injuries are serious.

In attempting to make ready the emplacements for the heavy siege artillery which it is proposed to use against Antwerp the Germans have been much harried by the Belgian aviators. In an interesting despatch the *Daily Mirror* correspondent on Saturday pointed out :—

"The Germans are working and fighting hard to establish concrete emplacements for their gigantic siege guns. They have not yet succeeded in doing so.

"Belgian airmen promptly discover German forces of engineers at work. A sortie is made by a Belgian force, the Germans are dispersed and their work destroyed with dynamite.

"I am informed they have not yet succeeded in winning a base for a single siege howitzer. They tried it at Hofstadt and Semps and failed, and now they are seeking a base at or near Lipploo."

This work was also referred to by an *Observer* correspondent, who stated :—

"The small corps of aviators, who have done splendid work, have brought back information to the effect that the Germans, who are well entrenched some 10 or 12 miles beyond the outer line of fortresses, are merely biding their time until their heavy siege guns can be brought into action."

In a message relating to the crossing of the Aisne a *Daily Mail* correspondent writes of the work of the aviators :—

"Not until the pontoon bridge had twice more been destroyed, however, were the German big guns silenced—thanks to the admirable reconnoitring work of two airmen. The crossing of the Aisne was then concluded in comparative immunity from shell fire."

On Sunday Paris was again visited by a German aeroplane, which dropped four bombs. One was dropped in Paris close to the Eiffel Tower, the intention probably being to wreck either the wireless installation or the Army Depôt just by. An old man was killed and a young girl seriously injured. The details are thus given by the *Daily Telegraph* correspondent :—

"This morning a Taube dropped a bomb at the corner of the Avenue Trocadero and the Rue Freycinet.

"A man received a terrible mortal wound, and a little girl's foot was blown off.

"There is a row of three and four storeys from the Rue Galliera to the Rue Freycinet, and from the latter to the Avenue Marceau along the Avenue Trocadero. Every window up to the roof is shattered, and even the inside doors and walls are pitted by the flying fragments.

"Halfway up the Rue Freycinet similar damage has been done. On the opposite side of the Avenue Trocadero a tree was cut clean away and a lamp-post bent and shattered.

"The outrage occurred at 11.15, when the American church close by was holding a service. The little girl's leg was shattered horribly, and she is probably dying.

It was later reported that the aeroplane had been brought down at Mont Geron—Seine et Oise—after it had dropped a bomb on a train carrying wounded soldiers.

The following reference to the incident was made in the German "official" wireless war news circulated on Tuesday :—

"The Taube aeroplane which flew over Paris under cover of fog threw several bombs in the neighbourhood of the Eiffel Tower, killing a grey-haired man and injuring his daughter."

In a message from Petrograd to the *Daily Mail* Mr. B. W. Norregaard stated a wounded officer, describing the German methods of fighting in East Prussia, says they dislike cold steel but make good use of their artillery, aeroplanes and armoured motor cars. "Aeroplanes and dirigibles circle over our artillery, dropping paper to locate the positions. At night time the aeroplanes drop large Bengalese lights over the artillery and small bright lights over the infantry. At first the German armoured motor cars with machine guns wrought considerable damage among our troops, but we soon managed to counter-attack successfully with artillery."

Among the list of French casualties appears the name of General Roques, who, it may be remembered, was in charge of the French Aeronautical Corps for some time. He was mortally wounded at Bar-le-Duc on Sept. 6th. The report of the shooting of Hellmuth Hirth by the German authorities for betraying military secrets appears to have been false, as news has been received in Amsterdam to the effect that not only is he still alive, but that he has been awarded the Iron Cross for heroic conduct.

A message from Paris on Monday stated that during the heavy fighting of the previous few days the British had been very successful in bringing down German aeroplanes. One man who said he saw two brought down on the same day described one, struck by shrapnel shell, as crumpling up like an egg before it fell in fragments to earth.

In writing of the German entrenchments, Mr. G. Ward Price, of the *Daily Mail*, said :—

"They are floored, many of them, with cement ; they are roofed over with boards covered with sods, that serve both to keep out the rain and to hide them from French or British aeroplanes ; they are divided into chambers communicating by doors."

A report from Tokio states that in the attack on Tsingtao the Japanese seaplanes are giving invaluable assistance in reconnoitring. One of them is believed to have demolished a portion of the defence works with a bomb.

At Grimsby, on Tuesday, the master of the Dutch trawler "Martha," belonging to Ymuiden, reported that while fishing 30 miles from Heligoland on the 23rd inst., seven German hydro-aeroplanes encircled his vessel, but after satisfying themselves as to his nationality flew away. They then stopped a steamer, which he believed to be the Swedish steamship "Bodel," which was proceeding on a course east by north. The Germans made the captain of the steamer alter his course S.S.E., which would take the ship to Heligoland, and six of the aircraft escorted her in that direction, as far as he could see, while the other machine flew off in the direction of Wilhelmshaven.

There is no Swedish steamer "Bodel" shown in Lloyd's List, but there is a Danish steamer "Bodil," which was at Hartlepool on the day named.

Writing in the *Daily Telegraph* last week on the subject of the Battle of the Aisne, Mr. W. T. Massey said :—

"On the 17th or 18th, I forget which day, a German aeroplane flying over our lines was caught in a heavy fire, and a sudden rocking of the machine indicated that a bullet had been well placed. However, the aviator was able to turn to the north, and it looked as if he would land safely among his own people. The machine at first descended very gradually, but when it was within a few hundred feet above the ground it fell precipitately, and we had no doubt as to the result. Our opinion that the aeroplane was smashed was confirmed during the night, when a French officer of infantry and several men came into our lines and reported that they had been prisoners, but when the aeroplane fell close to them there was so much confusion among the enemy guarding them that they escaped."

"Another incident about which there was considerable pleasureable comment in our lines was the clever capture of German aeroplanes by a French cavalry patrol. Twenty cavalrymen, penetrating some thickly-wooded country, came upon a clearing in which there was a rich prize. Aviators and a number of mechanics were engaged in overhauling five Taube aeroplanes, and the patrol made a dash to round up the lot. There was a fierce resistance, and twelve of the cavalrymen were killed before the airmen were beaten. These aeroplanes will never fly again."

Models

Edited by V. E. JOHNSON, M.A.

A Compressed Air-Driven Model Waterplane.

MR. D. HISCOX sends us the following interesting account of his latest model, viz., a hydro-aeroplane of the monoplane species: "It has a span of 4 ft., and weighs 1·5 lbs., and is driven by an "autoplan" compressed air plant and fitted with a specially designed propeller. The machine has proved itself an efficient flyer, and rises from the surface of the water after a 'run' of about seven yards."

A hydro-aeroplane model is always one which it is extremely difficult to photograph, and the accompanying illustration which our correspondent sends us is a particularly happy one, showing as it does the model rising, just clear of the water. Our readers should notice the "wake" clearly shown on the right of the photograph.

Mr. D. Hiscox's compressed air-driven model waterplane.

"If I am not mistaken," says Mr. Hiscox, "mine is the first power-driven model waterplane to make a successful flight."

We presume Mr. Hiscox means the first successful model waterplane to be driven by compressed air. Our correspondent unfortunately omits to state either the length or duration of his best flight.

These continued successes with compressed-air motors are full of especial interest, and there is not the slightest doubt it is a type of motor which could be considerably further developed, especially for experimental work.

After all, that most deadly of all modern weapons, viz., the terrible torpedo, is driven by compressed air; and since the air has been heated, as in the latest types, its range has been about doubled.

We look forward to seeing ere long something of the same thing done in the case of model aeroplanes, to say nothing of model hydroplanes and submarines.

Mr. Laing's "Compressed Air" Tractor Model.

In our issue of September 4th, under the title of "Compressed Air Machines on Wimbledon Common," an account was given of some most interesting experiments carried out by Messrs. Laing, Pavely and Wilkinson. Both Messrs. Pavely's and Wilkinson's machines were illustrated in full flight. This week we are glad to be able to give another of Mr. Conolly's excellent photos, showing Mr. Laing's machine making a duration record for such models of no less than 43 secs., the best of quite a number of lengthy flights which this machine has made. Our readers will learn with interest that it took the united efforts of three "Wimbledonians" to pump up the caterpillar, otherwise known as the reservoir. No record exists of the lbs. pressure per square inch, but it is believed to be not far off

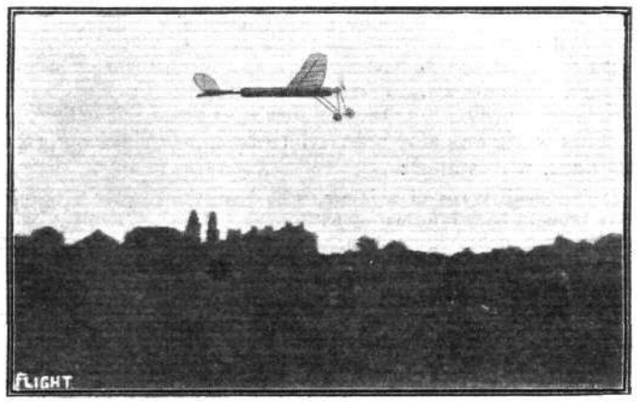


Photo. by Mr. Conolly.

Mr. Laing's compressed air tractor model, making a duration record on Wimbledon Common.

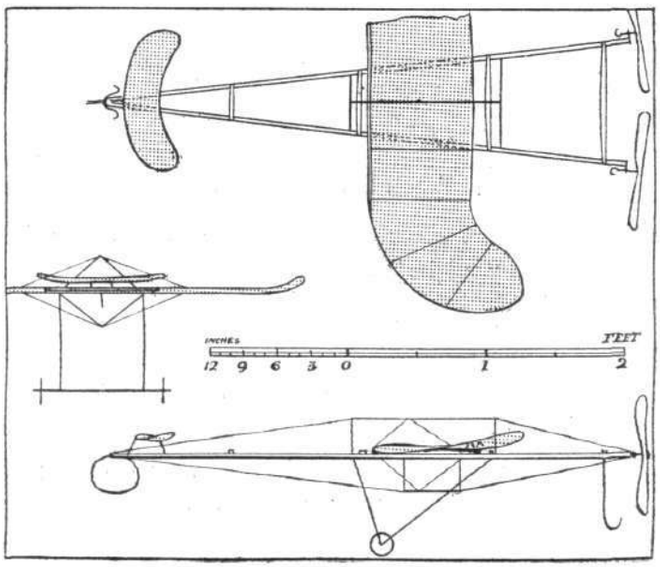
bursting point, not on the part of the reservoir only. The great aim of all the exponents of perpetual motion is to invent a machine which should give out more energy than is put into it.

Pumpers-up of compressed air reservoirs are, we understand, no believers in such machines; they say, as a matter of fact, that the boot is on the other leg. That the record flight to date should have been made with a tractor machine says much for the careful designing of the same.

Mr. C. L. Matson's Olympia Model.

Mr. Matson, of the Stony Stratford and District Model Aero Club, sends along the following particulars and drawings of the model exhibited by him at Olympia in March last:—

"*Type* of model 1–1–0–2P. The *fuselage* is of the usual A frame type, 44 ins. long and 10 ins. wide at the base. The *longitudinals* are $\frac{1}{2}$ in. by $\frac{1}{4}$ in. section and the four cross-pieces $\frac{3}{8}$ in. by $\frac{1}{8}$ in., all of silver spruce. The *main plane* is of 36 ins. span, and has a



Mr. C. L. Matson's Olympia model.

maximum chord of 9 ins., and an area of just over 2 sq. ft. The *elevator* has a span of 12 ins. and a chord of 3 ins. The tips of both are swept upwards and backwards. Both main plane and elevator are made of steel piano wire (18 to 20 gauge), with 9 and 4 ribs respectively, and are covered with Japanese silk proofed with boiled linseed oil. The leading edge of the main plane is stiffened for about half its length by a piece of silver spruce of section $\frac{3}{8}$ in. by $\frac{3}{16}$ in.

"The *motor* consists of ten strands of $\frac{1}{4}$-in. strip rubber to each propeller, the total weight being 3 oz., and the approximate number of permissible turns being 900.

"The plane is also braced by 8 wires (two on each side above and below) to *cabanes* of the old Blériot type. The camber in the centre of the main plane is about an inch. The propellers have a diameter of about 10 ins. each and an approximate pitch of 30 ins. They are of the bent wood type, and are formed out of satin walnut about $\frac{1}{16}$th of an inch thick.

"The *chassis* is 9 ins. high, and consists of two wheels of $\frac{1}{16}$-in. birch, 2 ins. in diameter, on the end of an axle supported by two Vs of 16 gauge piano wire attached to the *fuselage*. These wheels are about two inches forward of the centre of gravity. There is also a skid, 5·5 ins. high, of piano wire at the back which also serves to protect the propellers.

"The total weight of the machine is 11·75 oz., and the loading about $4\frac{3}{8}$ oz. per sq. ft. It rises in about twice its own length off hard ground."

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KITE AND MODEL AEROPLANE ASSOCIATION.

Official Notices.

British Model Records.

Single screw, hand-launched	Duration ...	J. E. Louch	...	95 secs.
Twin screw, do.	Distance ...	R. Lucas ...	...	590 yards.
	Duration ...	G. Hayden	...	137 secs.
Single screw, rise off ground	Distance ...	W. E. Evans	...	290 yards.
	Duration ...	J. E. Louch	...	68 secs.
Twin screw, do.	Distance ...	L. H. Slatter	...	365 yards.
	Duration ...	J. E. Louch	...	2 mins. 49 secs.
Single-tractor screw, hand-launched	Distance ...	C. C. Dutton	...	266 yards
	Duration ...	J. E. Louch	...	91 secs.
Do., off-ground	Distance ...	C. C. Dutton	...	190 yards.
	Duration ...	J. E. Louch	...	94 secs.
Single screw hydro., off-water	Duration ...	L. H. Slatter	...	35 secs.
Single-tractor, do., do.	Duration ...	C. C. Dutton	...	29 secs.
Twin screw, do., do.	Duration ...	S. C. Hersom	...	65 secs.
Engine driven off grass	Duration ...	D. Stanger	...	51 secs.

Farrow Shield.—This competition will be held at Wimbledon Common on Saturday, the 3rd, this is the final round.

Secretaries' Meeting.—It is proposed to hold a secretaries' meeting shortly in order to discuss the programme for the winter months, and to discuss important business. The secretaries of the various clubs will be informed as to the exact date and time, and it is hoped that everybody will make it convenient to attend.

Please address all communications with regard to models to H. A. Lyche, 46, Templesheen Road, East Sheen, S.W.

AFFILIATED MODEL CLUBS DIARY AND REPORTS.

Club reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Aero-Models Assoc. (30, CORRINGHAM RD., GOLDERS GREEN).

OCT. 3RD, Farrow Shield (final) *v.* Leytonstone, Wimbledon Common. Oct. 4th, practice as usual. Nov. 1st, third annual competition for the Enfield Challenge Cup and silver medal. During the winter the club will meet Sunday mornings 10 o'clock. With the exception of those noted above, no further competitions will be held this year.

Monthly Report.—Despite the present unsettled state of affairs, some useful work has been carried out. Considerable attention is now being paid to scale models powered with rubber, and very promising results have been obtained. Mr. Claflin has found time to construct two tractor monoplanes. The first machine was 5 ft. 6 ins. span, wings slightly backswept, and 4 ft. long over all. A large section covered in *fuselage* on the lines of the Military Trials Hanriot and a central skid chassis were fitted; 28 strands of $\frac{1}{4}$ in. strip drove an 18 in. propeller through twin gearing. The total weight was 24 ozs., and the loading about 6 ozs. per sq. ft. This model rose off short grass after 20 ft. run, and made steady flights usually straight down wind of about 25 secs. duration and 150–200 yds. distance. The second model is built on similar lines, but the span is increased to 6 ft. 6 ins. and the weight reduced to 20 ozs., loading 4 ozs. per sq. ft. Three different 18-in. propellers have been tried, the latest of which gives 1 lb. thrust on 24 strands of $\frac{1}{4}$ in. strip. From this it will be seen that Mr. Claflin believes in a good reserve of power. The model jumps off the ground, down wind, in its own length, climbs to about 40 ft. and keeps up for 30 secs., finishing with a glide, propeller stopped. Its performance would probably be improved if the tail could be induced to fly a little lower. A contrast to this machine is Mr. Nicholls' scale Nieuport of 1¼ lbs. weight and about 12 ozs. loading, which, however, gets off at a surprisingly low speed. The chassis of this model collapsed as a result of a sideslip and nose dive act. Mr. Nicholls has started on a new model, but rejoined his old regiment before it was finished. Mr. Fletcher has constructed a carefully streamlined tractor, the *fuselage* and tail of which are reminiscent of the monococque "Dep.," a central skid chassis is used, the total weight is about 1¼ lbs. and the loading about 5 ozs. per sq. ft. This machine is noticeably stable, and will hang into the wind almost stationary without stalling or sideslipping; a duration of about 25 secs. was obtained An attempt to demonstrate the machine in the street unduly shortened its career, and its successor lies unfinished owing to Mr. Fletcher's enlistment. Mr. Fletcher was in our Farrow Shield team for the semi-final, but was called up the same week, before finishing his model. His previous duration 'bus did 111 secs. (type *o-1-1-P2*). In all, three of our team joined the army that same week, the other two being Messrs. R. L. and A. Rogers. By dint of increased activity on the part of those remaining we succeeded in beating the Paddington club by a narrow margin in this event. Our team comprised Messrs. McBirnie, Claflin, Hindsley, Root, Partridge and Johnson, of whom Mr. Root obtained top average with 60½ secs, and Mr. Claflin lowest, he being so unfortunate as to break his machine, and so score an average of 0. Regarding duration models, Mr. McBirnie entered a single-screw machine for the Paddington Cup, and obtained second prize, besides competing in the Farrow Shield. Mr. Hindsley has continued his experiments with 8 oz. twin-screw "Arrow" plain tail models, obtaining up to 90 secs. Less than 17° sweep back appears to be of little value for stability, 20° sweep back provides splendid stability, but the loss of efficiency when duration is the ruling factor is marked. With a straight plane, higher durations were obtained, and a splendid glide, but this model was not reliable in a wind. Mr. Claflin has had out a series of three twin-screw elevator r.o.g. machines, all of which have exceeded the 100 sec. mark. The climbing angle of the latest demonstrates the efficiency of the large diameter propellers used, its gliding angle is also exceptionally good, 120 secs. flight having been obtained with only 50 secs. motor run (not fully wound). This model is 10½ ozs weight, 4 ft. 6 ins. span, and 4 ft. long. He has also flown his 6-minute tractor, obtaining an average of over 100 secs. for three flights. This machine is not geared, and the plane is 48 ins. span by 3½ ins. chord. A small looping 'bus and a 14 oz. boomerang have also been out, both of which make things exciting for the bystanders. The boomerang, however, is slightly easier to dodge. Mr. Johnson has been a regular attender on Saturdays, and has flown four different machines, viz., two A-frame elevators, a tail behinder, and a tractor. This new Farrow Shield machine was getting up well on the 26th. Mr. Root has been up with an A-frame elevator 'bus, and Mr. Dann has had out a bow-frame single-screw floating tail model. He is now starting on a scale model, and has a steam plant under way. Mr. Murray has just finished a new 2-cyl. engine of under 2 ozs. weight, and will be building a machine for it shortly. Another member who has joined the Army is Mr. G. W. Pidsley, with whom, and with the other four, go the best wishes of the club. Arrangements are now being made for the storage of large scale models near the ground, and the secretary will be glad to hear from gentlemen interested in this class of work.

N.E. London Model Ae.C. (47, JENNER RD. STOKE NEWINGTON, N.)

THE club is holding a social late in October, date and particulars of which will be inserted later. The N.E. London cup is to be contested among members only on October 17th; the models are under no restrictions and duration is the deciding factor. A silver medal will also be given to holder.

Monthly Report.—New models out consisted of single canards by Lewin and Barton, tractor monoplane and biplane by Longstaffe; all were flying well excepting Longstaffe's tractor biplane, this was designed to be detachable. P. Cowderoy caused a welcome diversion from the commonplace by turning a twin into an infernal machine by the aid of crackers.

Paddington and Districts (77, SWINDERBY ROAD, WEMBLEY).

OCT. 3RD.—Handicap for single-propeller models and tractors.

Monthly Report.—On Sept. 5th, at Golder's Green, the semi-final for the Farrow Shield between Aero Models Association and Paddington took place. Owing to the cramped area of the flying ground and a gusty east wind blowing through the trees in close proximity to the starting-point, the results were very poor. The best performance was by Mr. Root (Aero Models), who made an average of 60½ secs. Mr. W. E. Evans (Paddington) was second best, with an average of 45¼ secs. The result was: Aero Models Association total 569 secs., and Paddington 560 secs. On Sept. 19th, the 8-oz. twin r.o.g. handicap was won by H. Woolley. W. E. Evans was second. Mr. R. Bird was tuning up his new compressed-air Canard monoplane. Some very promising hand-launched flights were made, although it could not be induced to get off the rising surface, which, no doubt, is rather too short for so large a model. This feat was, however, successfully accomplished on Sept. 26th, when two r.o.g. flights of about 15 secs. were made. The model rocked somewhat, owing to the elevator fixing not being quite firm, otherwise the flight was perfect. The final flight ended with a nasty smash, the model landing on a barbed wire fence about 120 yards from starting point. The extent of the damage, however, was only a broken wing. The single-screw r.o.g. competition was won by Mr. D. Driver, with an average of 62⅜ secs. W. E. Evans was second, and H. Woolley third. Mr. T. Carter again had his new large kite out, which flies high and at a good angle.

South-Western Aero Club (373, BRIXTON ROAD, S.W.).

OCT. 17TH, competition at Wimbledon Common, 3.30 p.m., all classes of machines, for stock, value 7*s.*, presented by club.

Monthly Report.—A duration handicap competition was held on Sept. 19th, at Wimbledon Common, 12 members competing. Very windy weather prevailed and durations were consequently rather low, 4 members having their models smashed, the remaining eight all completing the three competition flights and a test flight. The winner's duration marks were 68, and the runner up 66. A meeting was held in the evening at headquarters, presided over by the President, Mr. Prodger. Mrs. Prodger presented Mr. M. Prodger, the winner, with the first prize, an engraved silver cup, and the second prize, an engraved penknife, to Mr. Clarke. A third prize, a silver dessert pocket-knife, presented by Mr. Dickson for the best junior duration was also given to Mr. M. Prodger. A consolation prize, stock value 3*s.* 9*d.* was given Mr. Dan Prodger by the members, this competitor putting up a very good test flight, and was unable to overcome the result by handicap, although his flying was the best in the competition. It was decided to hold a competition on Oct. 17th, the club to give the prizes from the funds. A good many new machines have been built this month, Mr. D. Prodger, a "tabloid" twin pusher biplane, loading 8 ozs., very fast, quite stable longitudinally, but rather tricky laterally owing to planes warping. Mr. Peel, 4 ft. biplane, as yet not quite tuned up, Mr. Miller, 2 ft. A-frame, about 4 oz. loading; Mr. Bell, 3 ft. A-frame, about same loading. Some new machines are being constructed, Mr. D. Prodger having nearly finished twin-propeller built-up *fuselage* monoplane, Mr. Dickson just starting a built-up tractor monoplane, 3 ft. length, twin gears. The secretary is also just completing a 5 ft. long hollow spar r.o.g. monoplane, 4 oz. loading. It is intended to hold competitions fairly regularly during the winter. Three new members have lately joined the club, and everything, considering the club has only been going a few months, is very flourishing.

Stony Stratford and District Kite and Model Ae.C. (OLD STRATFORD).

Monthly Report.—Aug. 12th, Members meeting; subject, r.o.g. models. Contributors: Messrs. Matson, Mennell, and O. Hamilton, junr. A resolution was drafted for forwarding *re* the recognition of single screw h.l. models in the records. Rules for the special competitions were drafted. Mr. Palmer's attempt in Class 2b was passed as record, viz., 60½ secs. Aug. 15th, members' monthly

competition. Results: Mr. E. Brown, 1st, 91'75 marks; W. Palmer, 2nd, 69'5; H. Mennell, 3rd, 64'4. Mr. Brown has raised the club distance record during the competition to 480 yds. 2 ft. Aug. 22nd, M.S.C. prize for r.o.g. Winner: O. Hamilton, junr., average of 10'1 secs. O. Hamilton, junr., opened Class 5b with 13 secs. Mr. Palmer with his single improved the figures in Class 2a with 377 yds; he also improved the r.o.g. twin figures to 139 yds. Aug. 29th, Mr. W. Palmer improved the r.o.g. single figures to 32 secs. and 114 yds. 2 ft. R.o.g. flights averaging to 120 yds. by Messrs. Brown, Mennell, Palmer and Hamilton. Sept. 9th, members' meeting. Subject: frames and trussing. The record number of record sheets were considered at this meeting, five distinct attempts having been made during the preceding month, the classes being 2, 5 a and b, 1, 2a, 1, 4a, and 1a. It was decided to offer a pair of propellers, presented by M.S.C. Co. for the best performance by a novice. It was also resolved to divide Class 5 a and b into two classes, namely, Class 5 a and b single propellers r.o.g., and Class 6 a and b tractors r.o.g. A special rule was adopted re time of flight for r.o.g. models. Sept. 19th, members' competition. Results: Messrs. E. Brown, 1st, 72'5 marks; O. Hamilton, junr., 2nd, 22'5 marks. Gusty and tricky winds. Close of three months' best duration prize. Mr. Brown the winner, best time being 62'2 secs. Sept. 26th, Star prize competition. Winner, Mr. E. Brown, 89'6 marks; 2nd, O. Hamilton, junr., 76'1 marks. Mr. Brown made two or three unsuccessful sallies to break club duration record. Mr. O. Hamilton, junr., out trying for Class 3b, tractor h.l., but only obtained 5 secs. and then smashed up. Wind too rough for small model that was being used.

Wimbledon and District (165, HOLLAND ROAD, W.).

OCT. 3RD, flying at 2 o'clock. Oct. 4th, flying at 11 and 2 o'clock.

Monthly Report.—During the past month a great deal of flying has been done with both power and rubber-driven models. Mr. Laing's compressed-air tractor monoplane has flown every week, putting up some fine performances, his best flight of 43 secs. being a club record for c.a. models. Double-surface wings have now been fitted, and several slight alterations made to the tail and fin. Mr. Boniface's c.a. tractor mono. made its first appearance on Sept. 20th, making several good flights in a gusty wind. On the 26th it was out again, but a collision with a spectator damaged one wing. This was repaired, and the following day a number of flights were made, the average duration being about 22 secs. Several times, both this and Mr. Laing's machine were in the air together, affording a very fine sight. On Aug. 26th, the first c.a. tractor biplane was seen, Mr. Tucker's "Avro" biplane being out for its trials. Although not fitted with a suitable screw, several flights of about 20 secs. duration were obtained. Mr. Slatter had out his steam-driven tractor hydro. on the morning of the 26th, but was unable to get it off the water owing to engine trouble. It is anticipated that there will be a good show of power-driven models in the near future, as in addition to those already completed Messrs. Jannaway's and Chown's are nearing completion, and Messrs. Houlberg, Hayden and Lyche are commencing the construction of c.a. models. Rubber-driven models have been flown by Messrs. Hayden, Lyche, Wilkinson, Powell, and W. H. Smith. Mr. Hayden had out a single-pusher Canard machine, getting very high flights, but a collision with Mr. Laing's bicycle put it out of action. He has also flown a 5-oz. tractor, having double-surfaced wings, loading 2 ozs. per sq. ft., the best duration obtained being 78 secs. Mr Powell's twin-screw tailed model has been flying high, doing its usual 80's. Mr. W. H. Smith has flown a 3-oz twin, getting durations up to 90 at a very great height. Mr. Wilkinson has also flown a machine of this type. Mr. Lyche's Olympia tractor, which has been exhibited at the White City during the summer, was out on Aug. 18th. As might be expected, the fabric had deteriorated, but one very good flight was made. The machine, which is now being fitted with a new chassis, is of steel construction throughout, the *fuselage*, which is of triangular section, and the swept-back wings, with upturned tips, being constructed of umbrella ribbing.

Windsor Model and Gliding Club (10, ALMA ROAD.).

Monthly Report.—There has been very little model flying this month, the members doing most in this direction being Messrs. F. Camm, E. Stanbrook, and S. Spicer. Mr. Stanbrook is flying his model in camp, he having joined, in company with Mr. S. Dandridge and Mr. Domoney, the Army. It will thus be seen that the active membership of the club is depleted still more, especially as the secretary and Mr. E. Starnes are working at Brooklands. But in the face of this, the few remaining members are determined to carry the work forward. The power 'bus is rapidly nearing completion, the wings are all made and ready for covering. The engine is being finally tuned up before being fixed in the *fuselage* by Mr. L. Hughes, this being the second time he has come forward and helped the club in difficulty. The weight of the complete machine with engine will not exceed 300 lbs. There is 320 sq. ft. of surface, so that with a pilot of 150 lbs. she will be loaded about 1½ lbs. per sq. ft. It will be seen that the machine should lift easily at 25 miles an hour, its estimated flying speed being 35 miles an hour. It is yet too early to definitely say when she will be tried, but needless to say the first trials are looked forward to. Some unique fittings have been designed, and will be illustrated later. The wing section is similar to the B.E. wing section, with fairly flexible trailing edge. All struts are hollow, bound at intervals. Altogether the machine looks rather graceful, and it is hoped will be successful.

UNAFFILIATED CLUBS.

Finsbury Park and District (66, ELFORT ROAD, HIGHBURY, N.).

Monthly Report.—Very little flying during the month owing to weather. The Dunne (single plane) monoplanes by Messrs. A. Richards, B. H. Barnard, S. Gibbs, have all given a good account of themselves. The club celebrated its first anniversary on Sept. 26th by a competition, the first three finishing as follows:—B. H. Barnard, 389 pts.; G. Wren, 387 pts.; and A. Richards, 386 pts.; next on the list, Mr. Savage following with 332 pts. The events were duration, distance, stability, and height, and the scores of the first three were as follows:—Mr. B. H. Barnard, 64 secs., 135, 90, and 100; G. Wren, 66 secs., 126, 100, 95; A. Richards, 47 secs., 154, 95, and 90. All the machines were tractor monoplanes, this type finding more favour with members than the twin-screw or tail first models. Much good flying has been carried out, when the weather permitted, by Messrs. B. H. Barnard with Morane-Saulnier mono.; A. Richards, Martinsyde mono. with large *ailerons* on wing tips; H. Mullin, tractor mono.; G. Wren, Morane; and Mr. Savage, tractor mono., chiefly remarkable for its high dihedral angle of main wings and tail. It is pleasing to note that much improvement in design and construction have been made recently, and the actual flying is tending towards a higher level.

Liverpool Aero Research Club (62, CEDAR GROVE, LIVERPOOL).

OCT. 3RD, postponed Trophy Competition, Lister Drive, at 4 p.m. Oct. 8th, at 5 p.m., Cedar Grove.

Monthly Report.—Quite one of the busiest displays at a non-competition meeting took place by the following at Breckside Park, Sept. 5th, all machines being 1-1-0-P2:—T. W. Bennett, 40 to 48 secs. (arrow-plane); B. Tear, 30 to 32 secs. (negative-tips), and 32 to 36 secs. (dove); G. H. Kilshaw, 30 secs. (ordinary), 35 secs. (negative-tip), 25 to 30 secs. (gull wing), 15 secs. (r.o.g. covered-in *fuselage*); F. Lowe, 26 secs. (negative tips); L. Shone, 26 secs. (ordinary), J. Connolly, 25 secs. (negative tips); R. J. Clark (up-turned wing). Kilshaw and Lowe after, at night-flying, former lit-up, latter at fine altitudes. Sept. 10th, at Lister Drive, all canards:—T. W. Bennett, 32 secs., at over 90 ft. high (back-swept); L. Shone, 27 secs. (ordinary); B. Tear, 30 secs. (negative tips); F. Lowe, 25 secs. (negative tips). Sept. 12th, heavy rains, &c., spoiling work, only F. Lowe and L. Shone venturing out at Newsham. Sept. 19th, at Breckside Park, despite a perfect gale, following flying 1-1-0-P2's:—F. Lowe, 28 secs.; B. Tear, 30 secs.; L. Shone, 28 secs.; G. H. Kilshaw having r.o.g. tractor Etrich mono., and making a very pretty and exciting flight of 25 secs. The h.l. duration competition, after postponements on account of bad weather of late, took place Sept. 26th, at Lister Drive, before a large and interested crowd, the contest proving highly exciting and uncertain to the end, the result being extremely close:—1st, F. Lowe, 52 secs.; 2nd, B. Tear, 50 secs.; 3rd, L. Shone, 43 secs.; 4th, J. Connolly, 35 secs. G. H. Kilshaw and T. W. Bennett acted as time-keepers. Former, after, flying covered-in triangular *fuselage*, 1-1-0-P2; latter doing some splendid flights with r.o.g. 0-1-1-P2. Sept. 23rd, at Bootle, T. W. Bennett lost his fine h.l. 1-1-0-P2, being timed out of sight at 40 secs.

Scottish Ae.S. Model Ae.C. (5, DOUNE QUADRANT, GLASGOW).

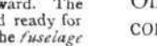
No definite dates have been fixed for meetings during October. Members having models ready should ring up the secretary on Fridays between the hours of 7 and 9 p.m., when he will advise them if there is a meeting the following day. Tel. 2,889 Western.

Monthly Report.—On Sept. 10th the annual general meeting was held in the Y.M.C.A. The various office-bearers were duly elected, the committee to be as follows: W. Foster, A. P. Mackim, J. Donaldson, and J. Mills. The financial statement showed a large balance in hand. A great many members have answered the call of their country, and are now serving in several regiments throughout *Britain*. Owing to this, the number of competitions and flying meetings will be greatly reduced until further notice. On September 19th members visited Paisley, Mr. J. S. Ross having some excellent flights with a twin-screw, h.l.; Mr. Pinney was also experimenting with the same type. Mr. Jas. C. Balden had out his "looper" and got two perfect complete loops in succession. On Sept. 26th, Mr. J. S. Ross and Mr. Pinney at Maxwell Park flying single-screw tractors, h.l., getting some good flights in spite of a tricky wind. The new session has now commenced, and the secretary will be pleased to hear from intending members. Hon. joint sec., Jas. C. Balden, 5, Doune Quadrant, Glasgow.

S. Eastern Model Ae.C. (154, PECKHAM RYE, S.E.)

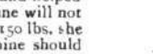
October 4th, Blackheath, 7.30 to 10 a.m.

Monthly report.—The South Eastern Trophy Competition for single propeller r.o.g. models (see FLIGHT, Sept. 4th) was held at Blackheath last Sunday morning, the excellent weather conditions resulting in a very satisfactory attendance. Mr. F. Plummer, a former trophy holder, kindly acted as timekeeper, and after a well-fought contest Mr. A. B. Clark (the club's late Hon. Sec.) was declared the victor, with G. Brown and R. W. Prance 2nd and 3rd respectively. It is proposed to make the next South Eastern Trophy Competition (to be held at the end of December) one for twin-propeller r.o.g. biplanes, instead of twin-propeller hydro-biplanes as previously arranged. Considerable activity has lately been displayed by the club's complement of "nuts," and one or two exceptional models are expected as the result. Although the present European crisis is being felt by the club it is not anticipated that any difficulty will be met in keeping the members together during the winter months. In fact "meetings as usual" will be the rule. The weekly meetings are still very well supported, some of the most consistent in their attendance being Messrs. A. B. Clark, W. Entecott, G. Brown, A. D. Nicholls, G. H. Westwood, A. F. Chinery, R. W. Prance and F. Edwards. New members are still being enrolled, and the Hon. Sec. will be pleased to answer any further enquiries.



Release Gears.

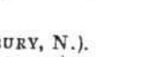
FROM all sides one gathers that business is going well in aviation circles, and we hear that the patent release gears of Messrs. Rubery Owen and Co, of Darlaston, are being largely purchased by the Admiralty and War Office, besides all the well-known leading aeroplane contractors.



PUBLICATIONS RECEIVED.

The "Home Notes" Books: The Little Dressmaker's Book. Edited by "Isobel." London: C. Arthur Pearson, Ltd. Price 1s. net.

Announcements, Educational and Social, for the Session 1914-15. Northampton Polytechnic Institute, St. John Street, London, E.C.



Aeronautical Patents Published.

Applied for in 1913.

Published September 17th, 1914.

19,336. DE B. HARTLEY. Aero-hydroplane flying-machine.

Applied for in 1914.

Published October 1st, 1914.

975. J. R. PORTER. Aeronautical machines.

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